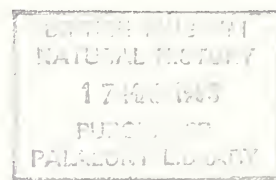


A Stereo-Atlas of Ostracod Shells

edited by R. H. Bate, J. W. Neale, Lesley M. Sheppard
and David J. Siveter



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Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Format should follow the style set by the majority of papers in this issue. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only. Blanks to aid in mounting figures for plates may be obtained from any one of the Editors or Editorial Board. Completed papers should be sent to Dr L.M. Sheppard.

The front cover shows a female left valve, external and internal views, of
Bilobatia serralobata Schallreuter.



ON *BRADERUPIA ASYMMETRICA* (NECKAJA)

by Roger E. L. Schallreuter
(University of Hamburg, German Federal Republic)

Genus *Braderupia* gen. nov.

Type-species: *Pseudostrepula asymmetrica* Neckaja, 1958.

Derivation of name: Braderup, the locality of the figured specimens. Gender feminine.

Diagnosis: Small to medium-sized palaeocope. Unisulcate; S2 moderately long. Asymmetrical: right valve has a distinct spine-like posteroventral lobe; in left valve it is absent or occurs (especially in females) only as a weak inflation. Velum in males and larger tecnomorphs is a rounded ridge, in females it forms a flange-like dolon, and is absent in young instars. Velar antrum admarginal, occurs antero- and centroventrally. Histium developed only in anteroventral and posteroventral regions, forms a more or less distinct, rounded ridge, and is only slightly dimorphic (weaker posteroventrally in males); histial antrum absent. Histiovelar furrow fissum-like anteriorly, posteriorly has a v-shaped profile and irregular row of puncta, continued posteriorly as an indistinct semisulcus. Laterohistial furrow anteriorly forms a distinct fissum parallel to histiovelar fissum-like furrow, posteriorly forms a more or less distinct u-shaped furrow or is absent. Marginal sculpture is a ridge or row of spines.

Explanation of Plate 9, 2

Figs. 1, 2, ♀ LV (GPIMH 2472, 880 µm long): fig. 1, ext. lat.; fig. 2, ext. vent. obl.
Scale A (100 µm; x 110), figs. 1, 2.

Remarks: *B. asymmetrica* was formerly questionally placed within the ctenonotellid genus *Pseudostrepula* (Schallreuter, *Palaeontographica* (A) 153 (4/6), 194, 1976; V. A. Ivanova, *Trudy Paleont.*, 172, 158, 1979), but because of the confirmed presence of a histium the species is here assigned to the Tetradellidae. *B. asymmetrica* is a sigmoopsine because it has a dimorphic histium which, moreover, is also present anteroventrally and antero-centrally as, for example, in *Sigmoopsis* (see below).

The only other unisulcate sigmoopsine genera are *Severobolbina* Schallreuter (*Geol. För. Stockh. Förh.* 96 (3 = 558), 278, 1974) and *Valdarella* Qvale (*Norsk Geol. Tidsskr.*, 60 (2), 102, (1980). In contrast to *Braderupia*, in *Severobolbina* the histium is also present centroventrally in females (where it is confluent with the velar dolon) but is missing in males and in the anterior regions of both dimorphs. Thus, *Braderupia* represents a different phylogenetic line leading to unisulcate members of the Sigmoopsinae and descends presumably from *Sigmoopsis*-like forms in which the histium is also present anteriorly as, for example, in *S. rostrata* (Krause) (Schallreuter, *Geologie* 15 (7), pl. 4 (p.873), fig. 4, pl. 5 (p.875), fig. 5). A third lineage is represented by *Valdarella*, which may have descended from *Kiesowia* (*Carinobolbina*)-like forms.

Valdarella resembles *Braderupia* by having histial and velar ridges parallel to each other and to the anteroventral margin in the females, but differs by the absence of a histium and velum in tecnomorphs and in the development of these sculptures in the anterior centroventral region of the females.

Ullerella ventroplicata Henningsmoen (*Norsk. Geol. Tidsskr.* 32 (1), 47, 1953) resembles *Braderupia asymmetrica* in certain respects but is not placed within the new genus because of the presence of a ridge in front of the velum in the anterior part of the valve (Henningsmoen, loc. cit., text-fig. 1 lower).

Explanation of Plate 9, 4

Fig. 1, ♂ LV, ext. lat. (GPIMH 2473, 820 µm long); fig. 2, juv. car., ext. vent. (GPIMH 2474, 510 µm long).
Scale A (100 µm; x 117), fig. 1; scale B (100 µm; x 192), fig. 2.



a



2a



b



2b

A



a



2a



b



2b

A

B

Braderupia asymmetrica (Neckaja, 1958)

- 1958 *Pseudostrepula asymmetrica* sp.n. A. I. Neckaja, *Trudj vses. nefi. nauchno-issled. geol.-razv. Inst. (VNIGRI)* **115** (= *Mikrofauna SSSR* **9**), 352, 353, pl. 1, figs. 8, 9.
- 1959 *Pseudostrepula asymmetrica* Neckaja; L. I. Sarv, *Eesti NSV Tead. Akad. Geol. inst. uurimused* **4**, 96-98, 193, tab. 2 (187), pl. 16, figs. 11-16, text-fig. 10G.
- 1960 *Pseudostrepula asymmetrica* Neckaja; L. I. Sarv, *Ibid.* **5**, tab. 1.
- 1970 *Pseudostrepula asymmetrica* Neckaja; A. Rõõmusoks, *Stratigrafija viruskoj i char'juskoj serij (ordovik) Severnoj Estonii* **I**, 216, 236, 267, 268, 289, 291, tabs. 12, 13, 15 (220, 246, 296).
- 1971 *Pseudostrepula asymmetrica*; R. E. L. Schallreuter, *Neus Jb. Geol. Paläont.*, **1971** (4), 250.
- 1971 *Pseudostrepula asymmetrica* Neckaja; R. E. L. Schallreuter, *Ibid.*, **1971** (11), 691.
- 1973 *Pseudostrepula* (resp. *Psuedostrepula*) *asymmetrica* Neckaja; A. I. Neckaja, *Trudy VNIGRI* **324**, 65, 66.
- 1973 *Pseudostrepula asymmetrica* Neck.; L. K. Gailite, *Problemy regionalnoj geologii Pribaltiki i Belorussii*, 67, tab. 2 (68).
- 1976 *Pseudostrepula* ? *asymmetrica* Neckaja; R. E. L. Schallreuter, *Palaeontographica* (A) **153** (4/6), 194, 198.
- 1976 *Pseudostrepula asymmetrica* Neckaja; N. Sidaravičienė, *Sovet. geol.* **1976** (8), 54, tab. 1 (50).
- 1976 *Pseudostrepula asymmetrica* (Neckaja); V. Jaanusson, *The Ordovician System* (Proc. Palaeont. Assoc. symp. Birmingham Sept. 1974; Ed. M. G. Bassett), text-figs. 10, 11 (faunal logs).
- 1979 *Pseudostrepula asymmetrica* Neckaja; N. Sidaravičienė, *Eesti NSV Tead. Akad. Toimetised (Geol.)*, **28** (4), 133, text-figs. 2, 3, 4 (faunal logs).
- 1979 ? *Pseudostrepula asymmetrica* (& *asimmetrica*) Neckaja; V. A. Ivanova, *Trudj paleont. Inst.*, **172**, 158, 159, 191, pl. 13, fig. 3.
- 1980 *Pseudostrepula asymmetrica* Neckaja; N. Sidaravičienė, *Eesti NSV Tead. Akad. Toimetised (Geol.)*, **29** (4), text-fig. 1 (faunal log).

Explanation of Plate 9, 6

Figs. 1, 2, ♀ RV (GPIMH 2475, 870 µm long): fig. 1, ext. lat., fig. 2, ext. vent. obl.
Scale A (100 µm; x 109), figs. 1, 2.

Holotype: Vsesojuznyj nefitjanov naučno-issledovatel'skij geologorazvedočnyj institut (VNIGRI) Leningrad, no. 3-128, ♀ RV.

Type locality: Raion Bolšie Korčany, Leningrad obl., Russia; lat. 59° 33' N, long. 29° 2' E. Viru Series (Middle Ordovician), Gubkov beds = Schundorov Substage of the Idavere Stage (C₃β).

Figured specimens: Geologisch-Paläontologisches Institut und Museum, University of Hamburg (GPIMH) nos. **2472** (♀ LV: Pl. 9, 2, figs. 1, 2), **2473** (♂ LV: Pl. 9, 4, fig. 1), **2474** (juv. car.: Pl. 9, 4, fig. 2), **2475** (♀ RV: Pl. 9, 6, figs. 1, 2), **2476** (♂ RV: Pl. 9, 8, figs. 1, 2). From the Upper Viruan (middle Ordovician) Hornstein erratic boulders no. Sy 52 (**2475**) and no. Sy 108 (**2472**, **2473**, **2474**, **2476**) of the Kaolinsand (Pliocene-Pleistocene), near Braderup, Isle of Sylt (N Frisian Is., N Sea) Germany; lat. 54° 56' N, long. 8° 21' E; coll. by Ulrich von Hacht in 1978 and 1980.

Diagnosis: As for genus.

Remarks: In the development of puncta in the histiovelar furrow *B. asymmetrica* resembles *Sigmoopsis* (*S.*) *granulata* (Sarv) and *S. (Sigmoopsoides) sigmoopsoides* Schallreuter.

Distribution: NW Russian Platform (Leningrad, Estonia, Latvia, Lithuania): Idavere (C₃), Jõhvi (D₁) and Keila (D₂) stages of the Viru Series, middle Ordovician. Rollsteinkalk (= Macrouruskalk) erratic boulders of Keila age of northern Germany; upper Viruan Hornstein erratic boulders of the Kaolinsand (Pliocene - Pleistocene) of the Isle of Sylt (N Frisian Is., N Sea), Germany.

Explanation of Plate 9, 8

Figs. 1, 2, ♂ RV (GPIMH 2476, 790 µm long): fig. 1, ext. lat.; fig. 2, ext. vent. obl.
Scale A (100 µm; x 122), figs. 1, 2.



1a



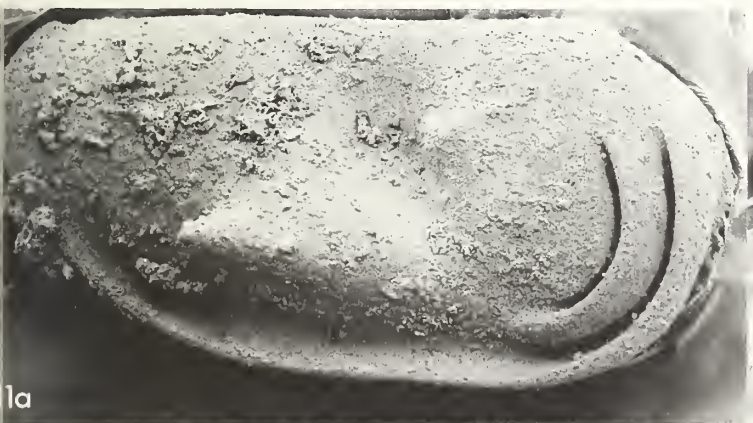
2a



1b



2b



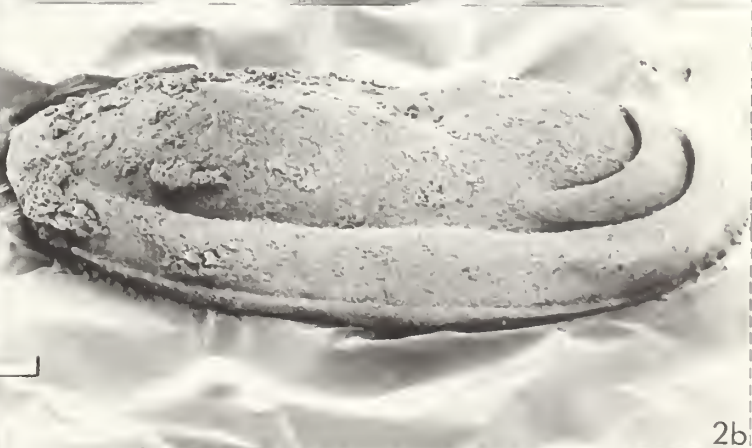
1a



2a



1b



2b

ON *BILOBATIA SERRALOBATA* SCHALLREUTER

by Roger E. L. Schallreuter
(University of Hamburg, German Federal Republic)

Genus *Bilobatia* Schallreuter, 1976

Type-species (by original designation): *Bilobatia serralobata* Schallreuter, 1976

Diagnosis: Median-sized palaeocope, adults 1-2 mm long; domicilium longer in males than females. A well developed oblong lobe occurs either side the main sulcus (S2), each having a row of short spines posterolaterally. Behind the strongly developed L3 there is a shallow S3 and a flat, indistinct L4. Velum in males represented by a row of spines or possibly as a flange. Female has a broad, convex, flange-like dolon adjacent to a well developed laterovelar furrow; dolon has a row of long peripheral spines more or less perpendicular to the contact plane, thus forming a typical wehrliine antrum. Marginal sculpture formed by a row of spines. Lateral surface more or less distinctly reticulate; dolonal flange striated.

Remarks: *Bilobatia* is characterized by its two distinct lobes and its prominent laterovelar furrow. Its phylogenetic origin is unknown. Presumably it descended from a smaller quadrilobate ancestor with a distinct L2. The stratigraphically older *Pectidolon* is larger, has a strong L1 and a relatively weak L2 and, therefore, could not be its ancestor.

Explanation of Plate 9, 10

Figs. 1, 2, ♀ LV (GPIMH 2493, 961 µm long excluding posterior spines): fig. 1, ext. lat.; fig. 2, ext. vent. obl.
Scale A (100 µm; x 92), figs. 1, 2.

Remarks (contd.): The special type of dolon of *Bilobatia*, with a row of spines forming the outer antral fence, is typical of the wehrliine type of antral dimorphism which was first described by Schallreuter (*Ber. geol. Ges. D.D.R.*, **10** (4), 484, 1965). This special kind of antral dimorphism is confined to the subfamily Wehrliinae and occurs in *Rakverella*, *Wehrliia*, *Pectidolon* and *Bilobatia*. Kesling (*Contr. Mus. Paleont. Univ. Mich.*, **12** (13), 1955) first described females of *Rakverella* ? *bonnemai* Öpik and noted in his description of the "false pouch of female": "Each frill consists of 29 or 30 spines, closely set and apparently fused only along their lines of juncture. . . . The spines composing the false pouch in *Rakverella bonnemai* are not as strongly fused as those in *Piretella acmaea* Öpik" (*op. cit.*, 265-266). The spines do not fuse at all (e.g. Kesling 1955, pl. 1, figs. 1, 2, 5, 6); there is a system of intervening gaps that is characteristic of wehrliine dimorphism. The function of such a special kind of a brood pouch is possibly to act like a cage, to hold the brood or eggs together and at the same time to supply them with fresh water.

Bilobatia serralobata Schallreuter, 1976

- 1965 *Ctenonotella bidens* Sarv, 1959; R. E. L. Schallreuter, *Ber. geol. Ges. D.D.R.*, **10** (4), 484.
1976 *Bilobatia serralobata* n. sp. R. E. L. Schallreuter, *Palaeontographica* (A) **153** (4/6), 205-207, pl. 8, figs. 1, 2, text-fig. 14, tab. 12 (q. v. for full synonymy).
? 1976 *Ctenonotella bidens* (Krause); V. Jaanusson, *The Ordovician System* (Proc. Palaeont. Assoc. symp. Birmingham Sept. 1974 Ed. M. G. Bassett), text-fig. 11 (faunal log).
1979 *Ctenonotella bidens* (Krause, 1892); V. A. Ivanova, *Trudy paleont. Inst.* **172**, 141-142(pars), pl. 10, fig. 12 (holotype).

Explanation of Plate 9, 12

Figs. 1, 2, ♀ RV (GPIMH 2494, 937 µm long): fig. 1, ext. lat.; fig. 2, ext. anterovent. obl.; fig. 3, incomplete ♀ RV, ext. posterovent. obl. (GPIMH 2495, 543 µm high).
Scale A (100 µm; x 97), figs. 1, 2; scale B (100 µm; x 85), fig. 3.



B

3a



A

3b

Holotype: Geologičeskij musej Akademija nauk Estonskoj SSR Tartu no. **Os 2210**, ♀ RV.

Type locality: Alliku, SW of Tallinn, Estonia; lat. 59° 21' N, long. 24° 33' E. Jõhvi Stage (D₁), upper Viruan middle Ordovician).

Figured specimens: Geologisch-Paläontologisches Institut und Museum, University of Hamburg (GPIMH) nos. **2493** (♀ LV: Pl. 9, 10, figs. 1, 2), **2494** (♀ RV: Pl. 9, 12, figs. 1, 2), **2495** (♀ RV: Pl. 9, 12, Fig. 3), **2496** (♂ LV: Pl. 9, 14, figs. 1, 2), **2497** (♂ LV: Pl. 9, 16, fig. 1) and **2498** (♂ LV: Pl. 9, 16, fig. 2). All from the upper Viruan (middle Ordovician) Hornstein erratic boulder no. Sy108 of the Kaolinsand (Pliocene - Pleistocene), near Braderup, Isle of Sylt (N Frisian Is, N Sea), Germany; lat. 54° 56' N, long. 8° 21' E; coll. by Ulrich von Hacht in 1980.

Diagnosis: As for the genus.

Remarks: The holotype of *B. serralobata*, a female right valve, is 1.25 mm long according to L. I. Sarv (*Eesti NSV Tead. Akad. Geol. Inst. uurimused* 4, 73, 1959). The females from boulder Sy108 are much smaller (0.90-0.96 mm) and, perhaps, this population represents a smaller sub-species. The males are considerably larger than the females (c. 0.98 mm long without velum; domicilium of the females: 0.77-0.80 mm). Therefore, the 3 largest larvae from Backsteinkalk boulders plotted in the diagram (text-fig. 14) and table 12 of Schallreuter (1976, op. cit.) presumably represent males and not stage II, as was assumed at that time, when no complete females were available from those boulders.

Explanation of Plate 9, 14

Fig. 1, 2, ♂ LV (GPIMH 2496, 984 μm long excluding spines): fig. 1, ext. lat.; fig. 2, ext. vent. obl.
Scale A (100 μm; x 93), figs. 1, 2.

Remarks (contd.): Based on a supposed ♂ fragment from the Rollsteinkalk boulder Ro2 it was formerly stated (Schallreuter 1976, op. cit., 205) that the males possess a velar flange. The figured specimen herein shows that the velum in males could also be developed only as a row of spines (Pl. 9, 14, figs. 1, 2).

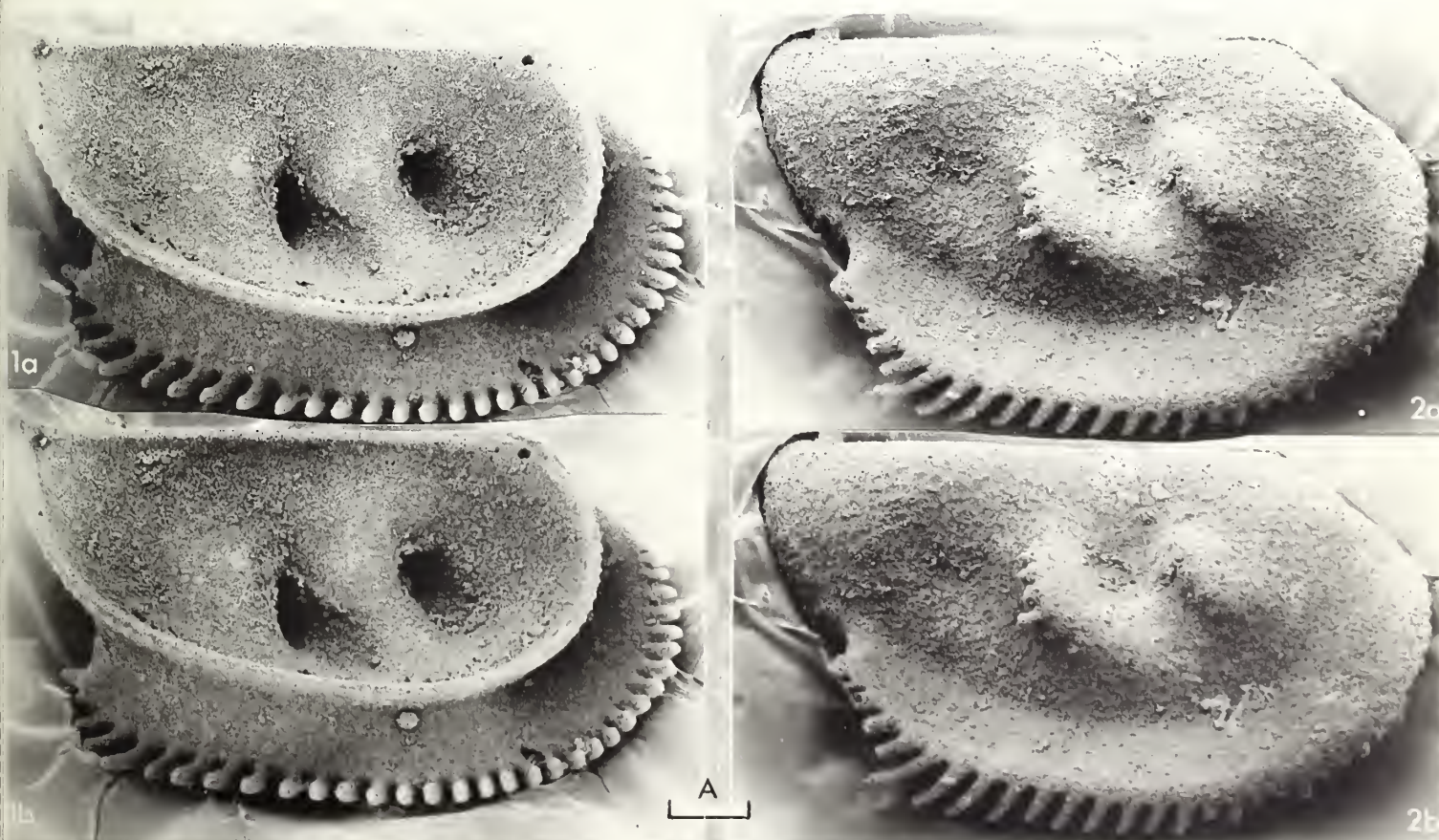
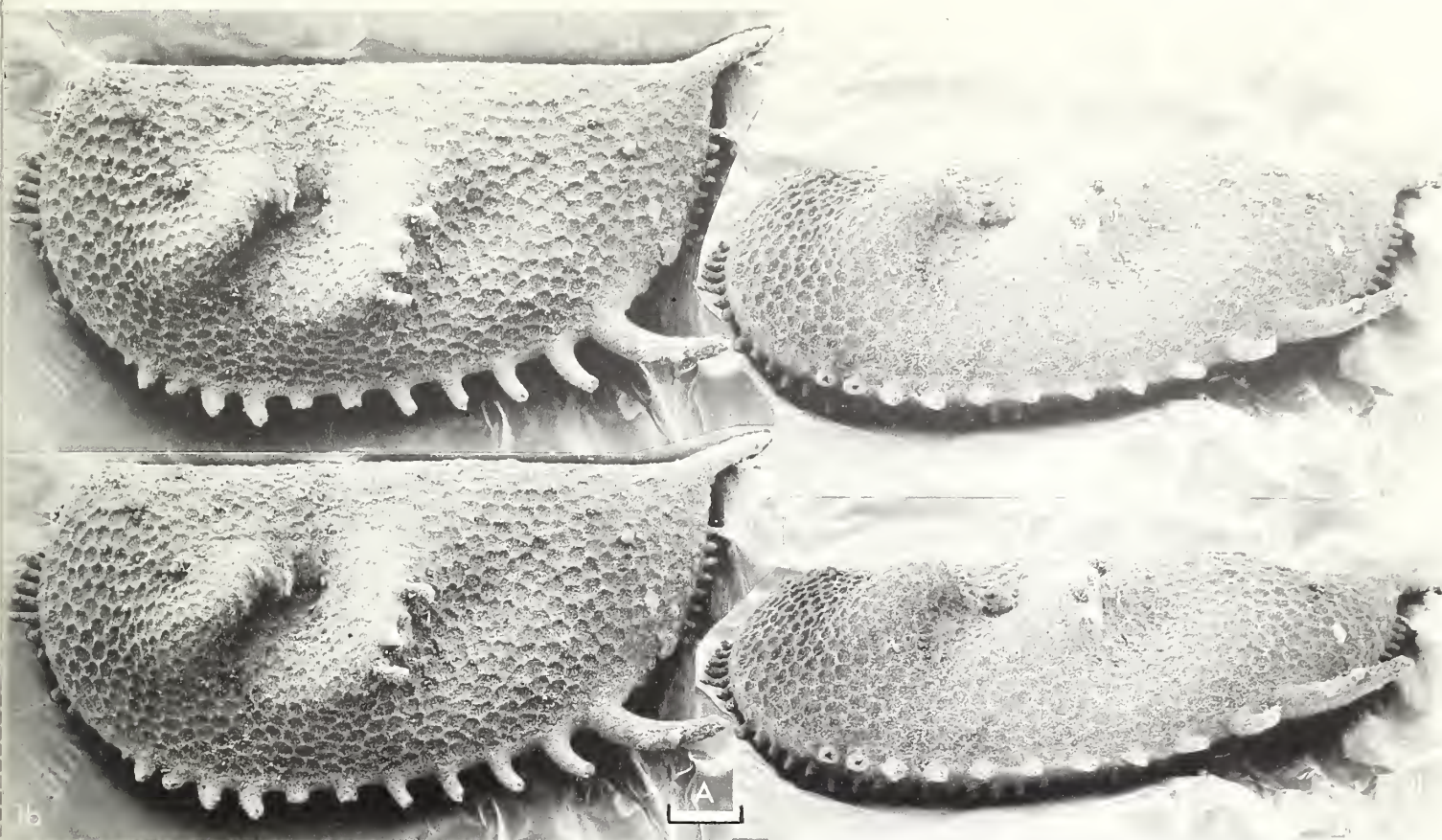
The posteriorly directed spines on the top of the central lobes are, on the figured specimens, distinct only on the posterior lobe, but they also occur on the anterior lobe (see Schallreuter 1976, op. cit., pl. 41 (8), fig. 1). Sometimes, next to the spines on the top of the lobes a row of fine pores occurs (Pl. 9, 12, fig. 3, Pl. 9, 14, fig. 2, Pl. 9, 16, fig. 2).

The lectotype of *Ctenonotella ? bidens* (Krause) is 0.83 mm long without velum (A. Krause, *Z. Deutsch. geol. Ges.*, 44 (3), 396 1892), and in this respect is of about the same size as the figured females of *B. serralobata*. In contrast to *B. serralobata* the flange in *C. ? bidens* reaches the cardinal corner and does not extend peripherally into spines (A. Krause, op. cit., pl. 22, fig. 12). If these features are the result of incorrect drawing *C. ? bidens* could possibly be a senior synonym of *B. serralobata*. If the lectotype of *C. ? bidens* is not a female valve it is distinguished from the males of the figured taxon by the velar flange.

Distribution: Northern Estonia; Jõhvi (D₁) Stage and Keila Stage (D₂), middle Ordovician. Backsteinkalk erratic boulders (14B2 type) and Rollsteinkalk (Macrouruskalk) erratic boulders (of Keila age) of northern Germany. Upper Viruan (middle Ordovician) Hornstein erratic boulders of the Kaolinsand (Pliocene-Pleistocene) of the Isle of Sylt (N Frisian Is, N Sea), Germany.

Explanation of Plate 9, 16

Fig. 1, ♀ LV, int. lat. (GPIMH 2497, 927 μm long excluding acroidal spine); fig. 2, ♀ RV, ext. lat. (GPIMH 2498, 902 μm long).
Scale A (100 μm; x 100), figs. 1, 2.



ON BYRSOLOPSINA MANCA SCHALLREUTER sp. nov.

by Roger E. L. Schallreuter
(University of Hamburg, German Federal Republic)

Byrsolopsina manca sp. nov.

Holotype: Geologisch-Paläontologisches Institut und Museum, University of Hamburg, no. **2519**, RV.
[Paratypes: nos. **2520-2525**].

Type locality: Öjlemyrflint erratic boulder (no. G30), Isle of Gotland (Baltic Sea), beach opposite the Isle of Lilla Karlsö; lat. 57° 18' N, long. 18° 8' E.; Upper Ordovician .

Derivation of name: Latin, *mancus*, meaning incomplete, imperfect; alluding to the incompletely reticulated lateral surface.

Figured specimens: Geologisch-Paläontologisches Institut und Museum, University of Hamburg (GPIMH) nos. **2519** (RV: Pl. 9, 18, fig. 1), **2520** (RV: Pl. 9, 18, fig. 2), **2521** (LV: Pl. 9, 20, fig. 1) and **2526** (LV: Pl. 9, 20, fig. 2). From the type locality, boulder no. G30 (nos. **2519-2521**), coll. by the author in 1976, and from Öjlemyrflint erratic boulder no. Sy56 (no. **2526**) of the Upper Kaolinsand (Lower Pleistocene, near Braderup, Isle of Sylt (N Frisian Is, N Sea); lat. 54° 56' N, long. 8° 21' E, coll. by Ulrich von Hacht in 1977.

Explanation of Plate 9, 18

Fig. 1, RV, ext. lat. (holotype, **GPIMH 2519**, 612 µm long); fig. 2, RV, ext. lat. (paratype, **GPIMH 2520**, 639 µm long).
Scale A (100 µm; x 140), figs. 1, 2.

Diagnosis: Species of *Byrsolopsina* with valves up to 0.64 mm long and moderately high (length:height ratio 1.75-1.55). Hinge-line short, cardinal angles distinctly greater than 90°. Lateral surface has fine, scattered puncta; punctate area generally tapering in an anterior direction.

Remarks: Of all the species of *Byrsolopsina* Swain & Cornell (in Swain *et al.*, *J. Paleo.* **35** (2), 363, 1961), *B. manca* most resembles *B. elkrunensis* Swain (*Ibid.* **36** (4), 725, pl. 109, fig. 2, 1962), particularly in the fine, incomplete punctation of its lateral surface. *B. manca* is distinguished from *B. elkrunensis* mainly by its shorter hinge-line and correspondingly larger cardinal angles.

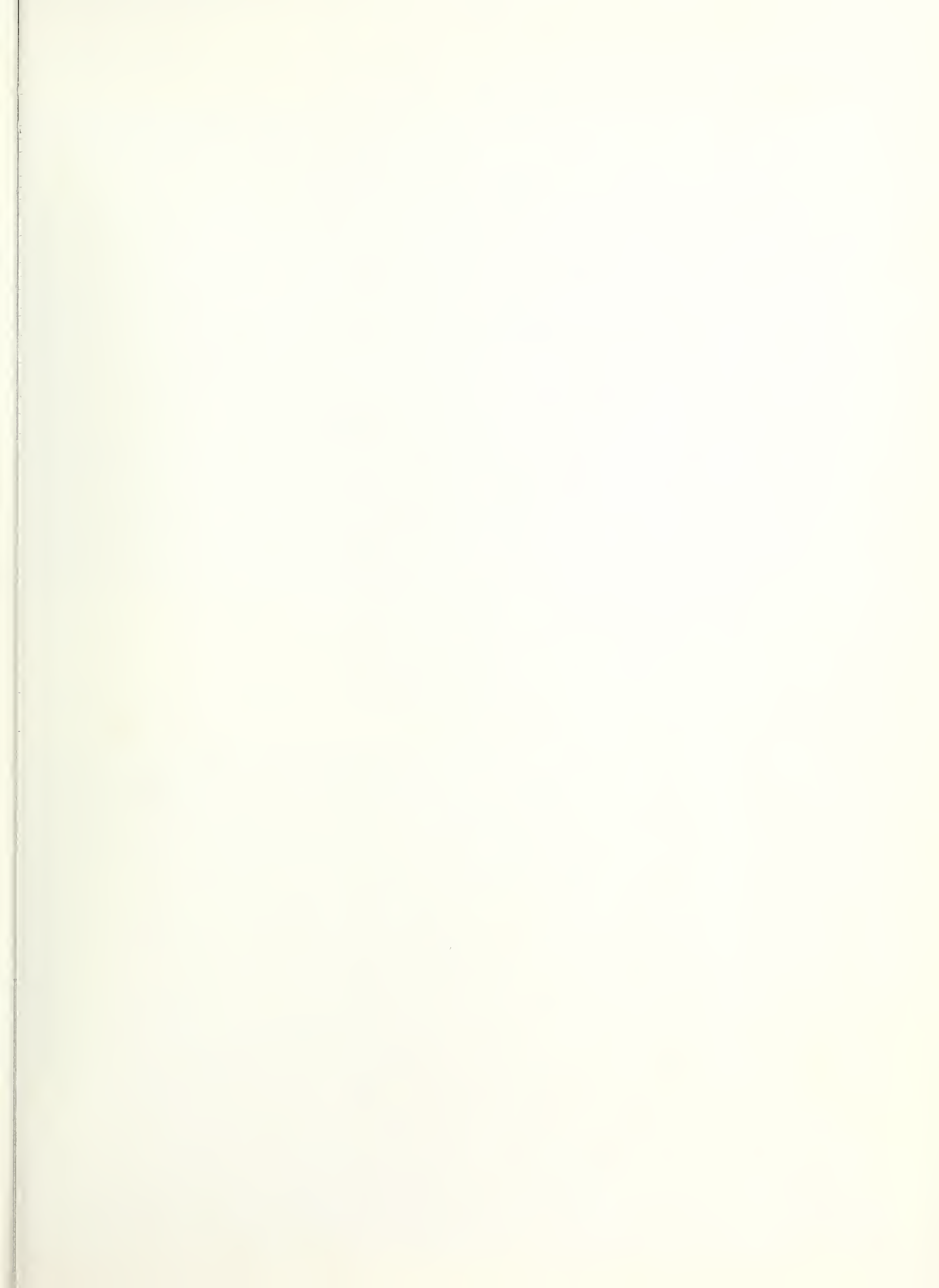
Compared with *B. manca*, *B. irregularis* (Keenan) (*J. Paleo.* **25** (5), 562, 1951) has smaller cardinal angles and a different pattern of distribution of puncta (Keenan 1951, pl. 78, fig. 34; Copeland, *Bull. Geol. Surv. Canada* **187**, pl. 4, fig. 2, pl. 5, figs. 4, 8, 1970).

Parapyxion sp. of Gailite [*Fauna i stratigrafija paleozoja i mesozoja Pribaltiki i Belorussii* (*The Fauna and Stratigraphy of Palaeozoic and Mesozoic of Baltic and Byelorussia*), 63, 1975] is possibly a congeneric form. Compared to *B. manca* it is larger, relatively higher, more elliptical and punctate only in the dorsocentral region.

Distribution: Known from the Öjlemyrflint (Upper Ordovician) erratic boulders of the Isle of Gotland (Baltic Sea) and of the Upper Kaolinsand (Lower Pleistocene) of the Isle of Sylt (N Frisian Is, N Sea).

Explanation of Plate 9, 20

Fig. 1, LV, ext. lat. (paratype, **GPIMH 2521**, 640 µm long); fig. 2, LV, ext. lat. (**GPIMH 2526**, 545 µm long).
Scale A (100 µm; x 145), fig. 1; scale B (100 µm; x 165), fig. 2.



ON *LOXOCONCHA CUNEIFORMIS* MALCOLMSON

by David J. Horne and Eric Robinson

(City of London Polytechnic and University College, London, England)

Loxoconcha cuneiformis Malcolmson, 1886

1886 *Lopoconcha cuneiformis* (sic), n. sp. Brady MS; S. M. Malcolmson, *Rep. Proc. Belf. Nat. Fld. Club*, appendix 1884-85, 261, pl. 25, figs. 1, 2.

Holotype: A male carapace (split into valves and remnants of soft parts dissected); G. S. Brady collection, Hancock Museum, Newcastle-upon-Tyne, no catalogue number but placed in a separate, labelled slide.

Type locality: Rockport, County Down, Ireland, approx. lat. 54° 39' N, long. 5° 46' W; intertidal, Recent.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **OS 12135** (♂ RV: Pl. 9, 22, fig. 1), **OS 12136** (♂ LV: Pl. 9, 22, fig. 2), **OS 12137** (♀ car.: Pl. 9, 22, fig. 3), **OS 12138** (♂ LV: Pl. 9, 24, fig. 1), **OS 12139** (♂ RV: Pl. 9, 24, figs. 2, 3, 4). Hancock Museum specimen (holotype: Text-figs. 1, 2). With the exception of the holotype, all specimens were collected by E. Robinson from Pleistocene (Ipswichian) marine clay in channels cut into Tertiary deposits on the foreshore at Selsey, Sussex, S England (approx. lat. 50° 47' N, long. 0° 50' W).

Explanation of Plate 9, 22

Fig. 1, ♂ RV, ext. lat. (**OS 12135**, 550 µm long); fig. 2, ♂ LV, ext. lat. (**OS 12136**, 560 µm long); fig. 3, ♂ car., ext. l. lat. (**OS 12137**, 500 µm long).

Scale A (100 µm; x 110), figs. 1-3.

Diagnosis: Carapace surface finely pitted, with ghost reticulation. Cuneate in dorsal view, with maximum width in front of mid-length. Strongly dimorphic, male markedly more elongate than female.

Remarks: Malcolmson sent his only specimen of this species to G. S. Brady, in whose collection it remains to this day. Brady recognised it to be a new species and gave it the manuscript name *L. cuneiformis*; it was, however, Malcolmson, not Brady, who published the type description.

Brady and Norman (*Scient. Trans. R. Dubl. Soc.*, ser. 2, **4**, 186, 1889) regarded *L. cuneiformis* as conspecific with *Loxoconcha tamarindus* (Jones) (*sensu* Brady (1868) = *Lindisfarnia laevata* (Norman) – see Horne & Kilenyi, *Stereo-Atlas of Ostracod Shells*, **8**, 107-116, 1981). From our examination of the holotype it is clear that *L. cuneiformis* is indeed a valid species, easily distinguished from related species by its cuneate outline in dorsal view.

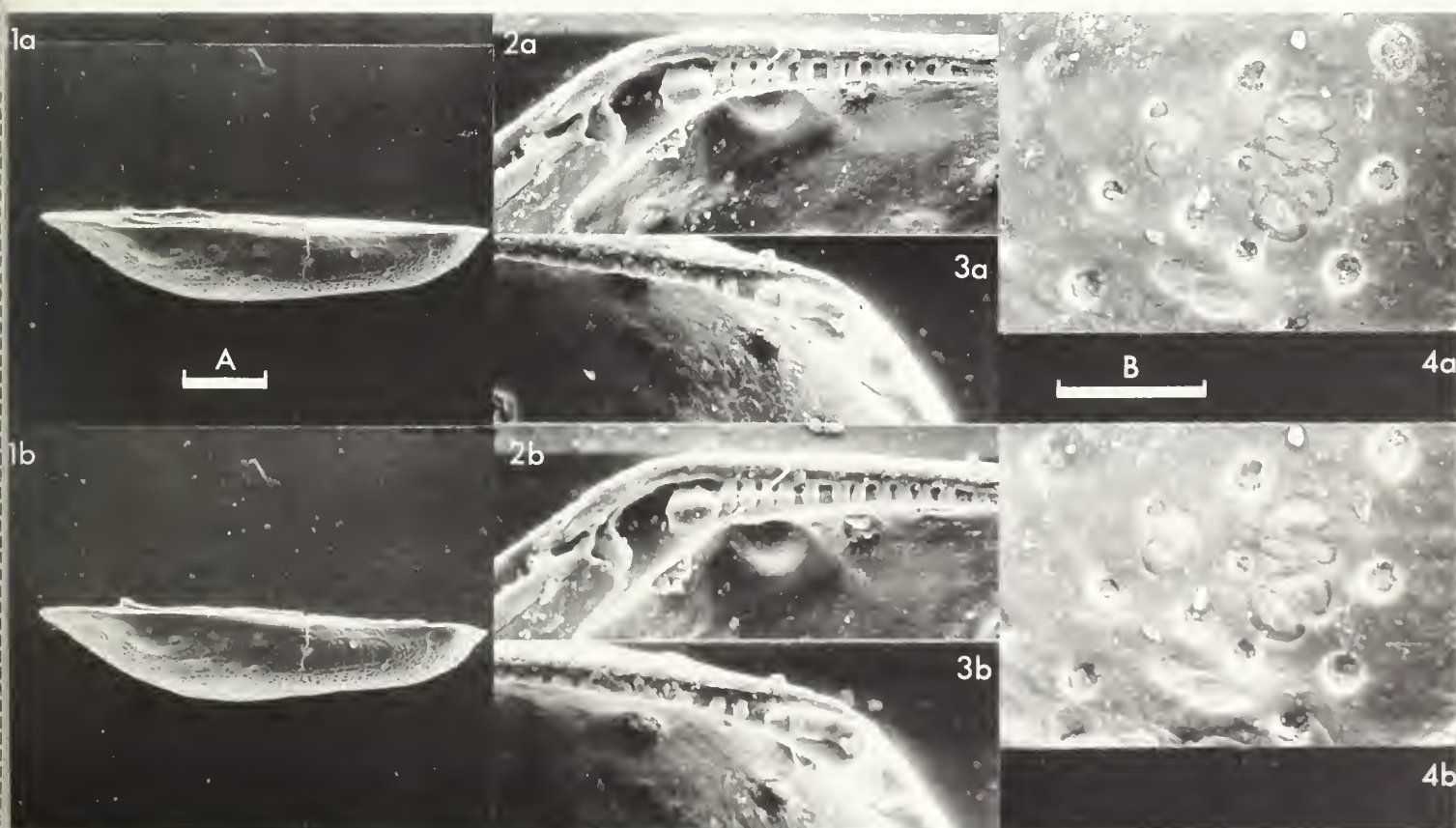
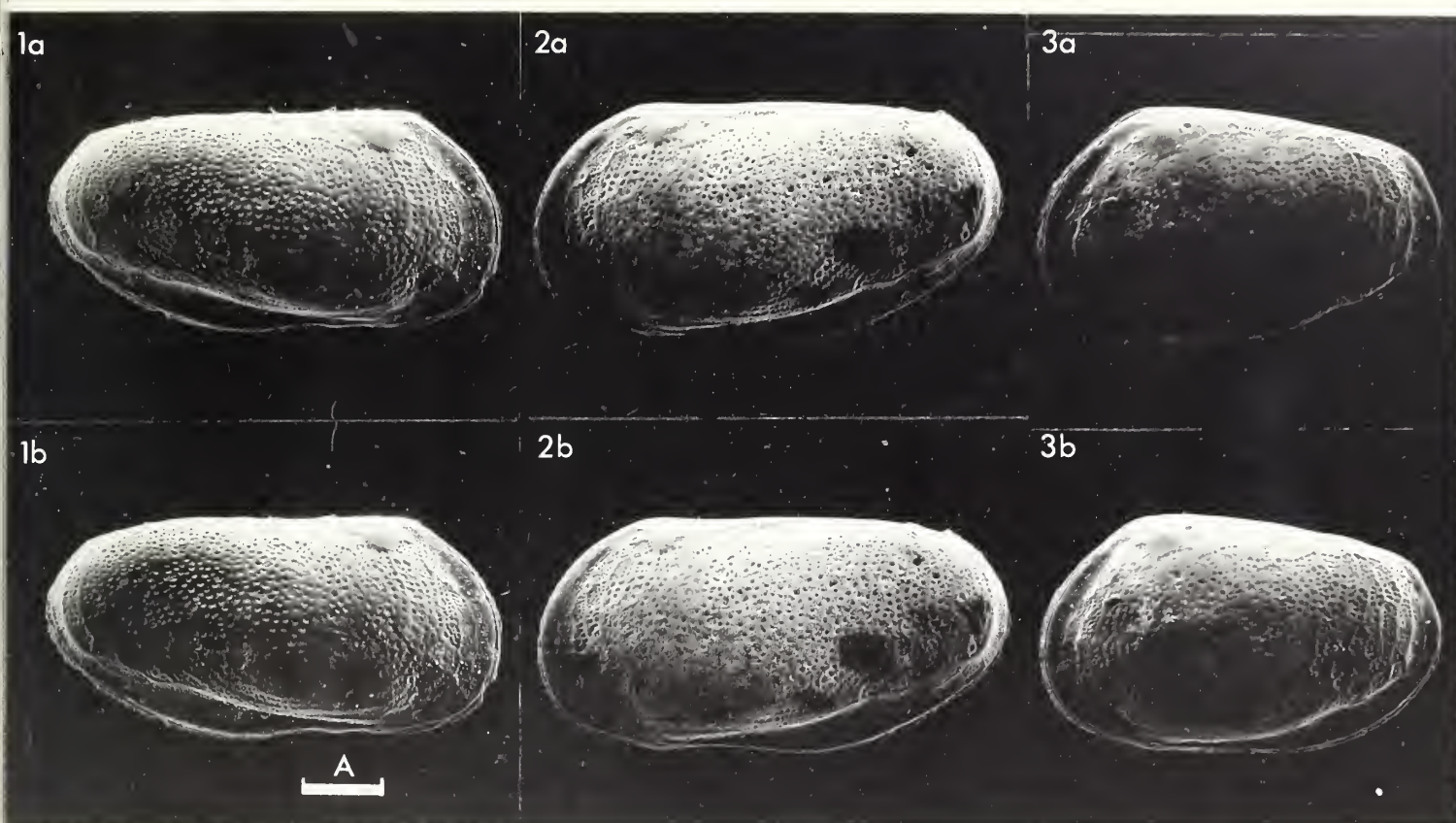
Apart from the presumed Recent holotype, we have only seen Pleistocene specimens of this species. Malcolmson's specimen contained a few poorly-preserved remnants of appendages, but this does not exclude the possibility that it may be a Pleistocene relict; we have found appendages in undoubted Pleistocene specimens of other species, obtained from borehole material.

Distribution: Pleistocene and Recent(?): British Isles (herein).

Explanation of Plate 9, 24

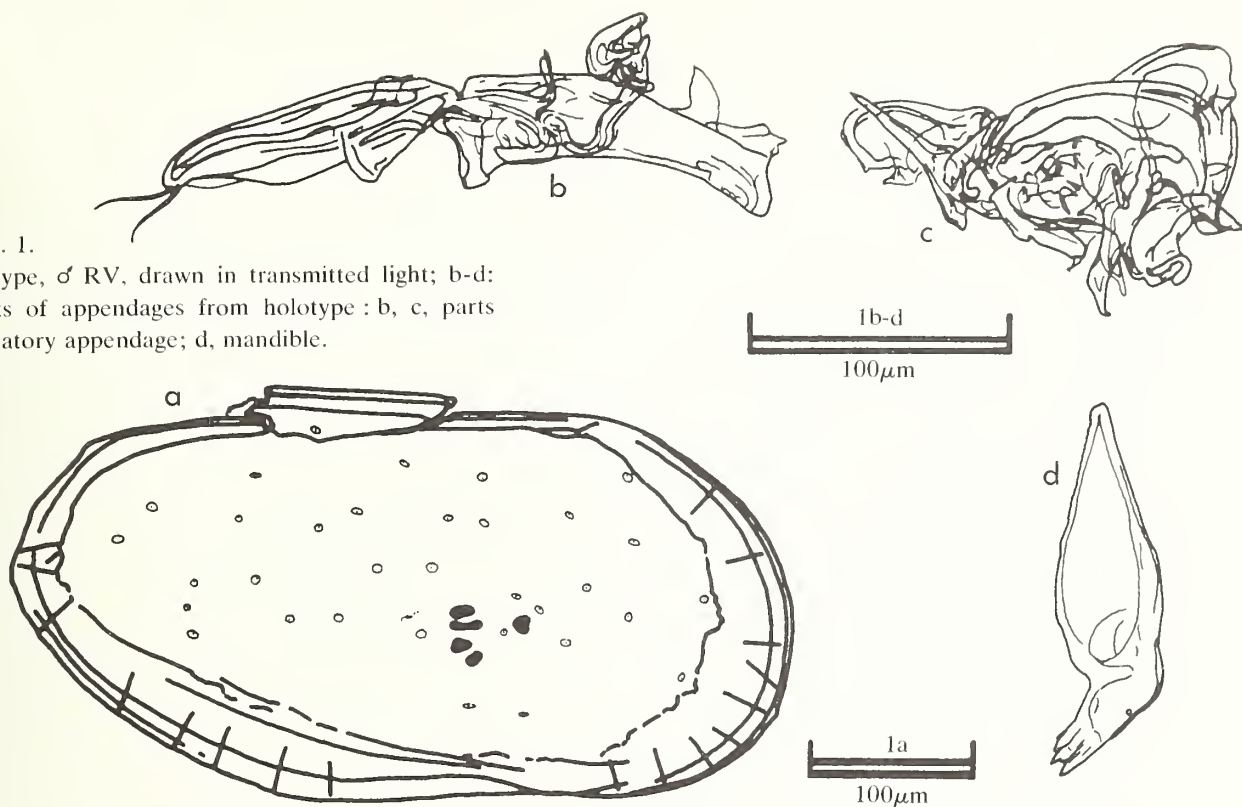
Fig. 1, ♂ LV, ext. dors. (**OS 12138**, 540 µm long); figs. 2, 3, ♂ RV, ant. and post. hinge elements (**OS 12139**); fig. 4, ♂ RV, int. musc. sc. (**OS 12139**).

Scale A (100 µm; x 110), fig. 1; scale B (50 µm; x 400), figs. 2-4.



Text-fig. 1.

a: holotype, ♂ RV, drawn in transmitted light; b-d: remnants of appendages from holotype: b, c, parts of copulatory appendage; d, mandible.



ON *LOXOCONCHA DIMORPHA* HARTMANN

by David J. Horne
(City of London Polytechnic, England)

Loxoconcha dimorpha Hartmann, 1959

1959 *Loxoconcha dimorpha* n. sp. G. Hartmann, *Zool. Anz.*, **162**(pars), 163-166, text-figs. 12, 13, 16, 17, 18 only, (non text-figs. 10, 11, 14, 15, 20).

Lectotype: (here designated). A decalcified male carapace with appendages (Paralectotype, a decalcified female carapace with appendages; syntypes, no. **K-28132**). All deposited in the Zoologisches Institut und Zoologisches Museum, Universität Hamburg.

Type locality: Tenerife, Canary Islands (approx. lat. 28° 15' N, long. 16° 35' W); intertidal, Recent.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **1982.32** (♂ LV: Pl. 9, 28, fig. 1; Pl. 9, 30, figs 1, 5), **1982.33** (♀ LV: Pl. 9, 28, fig. 2; Pl. 9, 30, fig. 3), **1982.34** (♀ RV: Pl. 9, 28, fig. 3), **1982.35** (♂ LV + appendages: Pl. 9, 30, fig. 2; Text-figs. 1a-e, 2b), **1982.36** (♀ LV: Pl. 9, 30, fig. 4). Hamburg Museum specimens (lectotype, ♂ copulatory appendage: Text-fig. 2a), **K-28132** (syntype, ♂ RV: Text-fig. 2c). Nos. **1982.32-36** collected alive from intertidal algae at El Medano, Tenerife, Canary Islands (approx. lat. 28° 15' N long. 16° 35' W) by M. Linley in 1980. Hamburg Museum specimens from Hartmann's syntypic material.

Explanation of Plate 9, 28

Fig. 1, ♂ LV, ext. lat. (**1982.32**, 580 µm long); fig. 2, ♀ LV, ext. lat. (**1982.33**, 490 µm long); fig. 3, ♀ RV, ext. lat. (**1982.34**, 480 µm long). Scale A (100 µm; x 110), figs. 1-3.

Diagnosis: Carapace robust, strongly ornamented, with pitting in central area giving way to reticulation in marginal areas. Sexual dimorphism marked, male more elongate than female. In dorsal view, greatest width behind mid-length. Male copulatory appendages of typical *Loxoconcha* shape: basal part broadly oval and about twice the size of the sub-triangular head-piece which has a convex ventral margin and a rounded, slightly upturned distal (anterior) corner.

Remarks: A comparison of specimens of two species of *Loxoconcha* from Tenerife with the original description and figures of *L. dimorpha* suggested that Hartmann (*op. cit.*) had inadvertently combined the male of one species with the female of the other and described them as a single species. This view was confirmed by the original author (Hartmann, pers. comm.) and by a re-examination of his syntypic material, which was found to include adult male specimens corresponding to the type description and figures of the male of *L. dimorpha*, but adult females of *two* species. One female form, corresponding to Hartmann's original description and figures of the female of *L. dimorpha*, belonged to a species described elsewhere as new (Horne, *Stereo-Atlas of Ostracod Shells*, 9 (6), 33-40, 1982); the other matched those illustrated herein as the true female of *L. dimorpha*.

A male and a true female of *L. dimorpha*, selected from the syntypes and dissected, are designated herein as lectotypes.

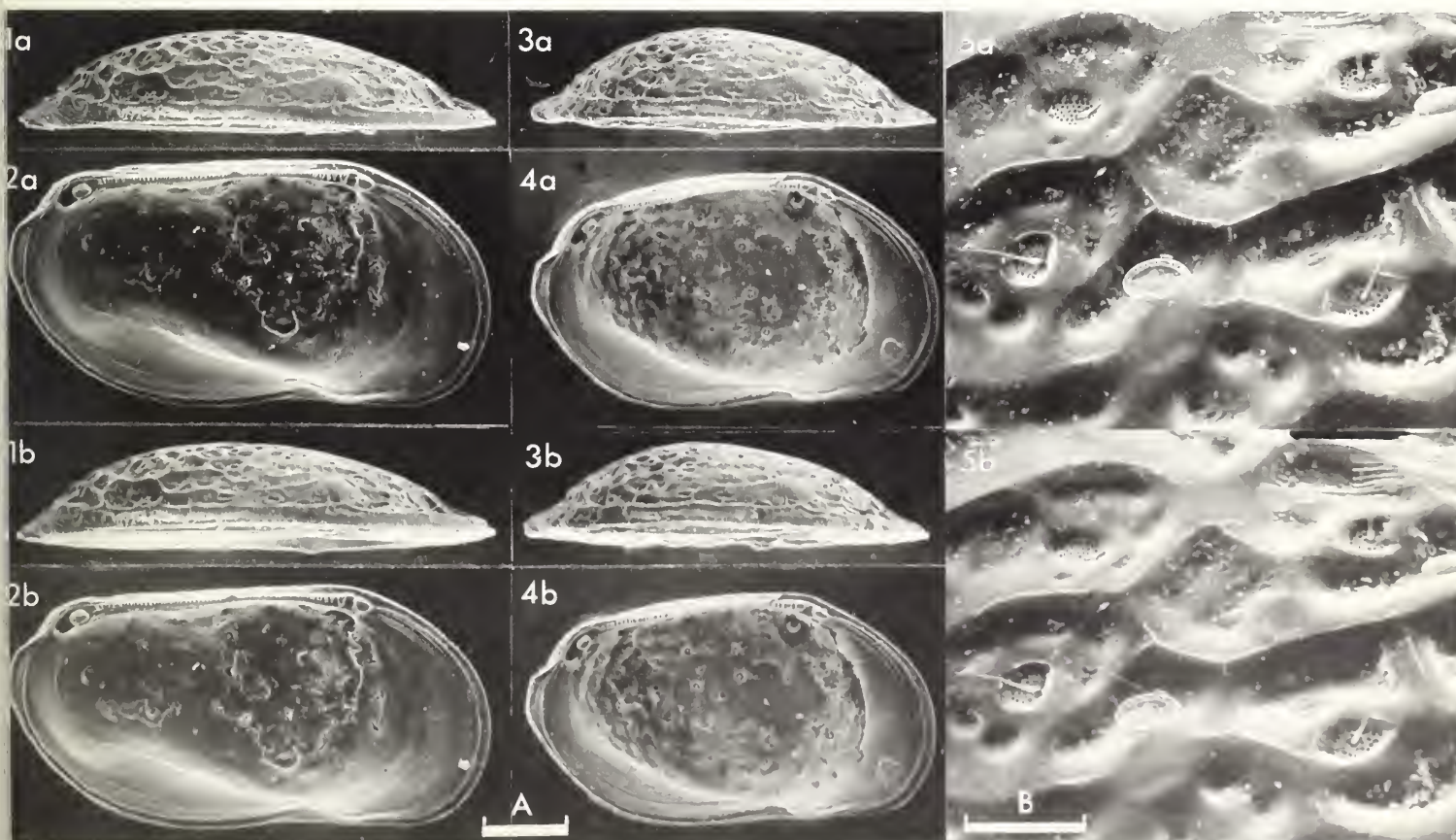
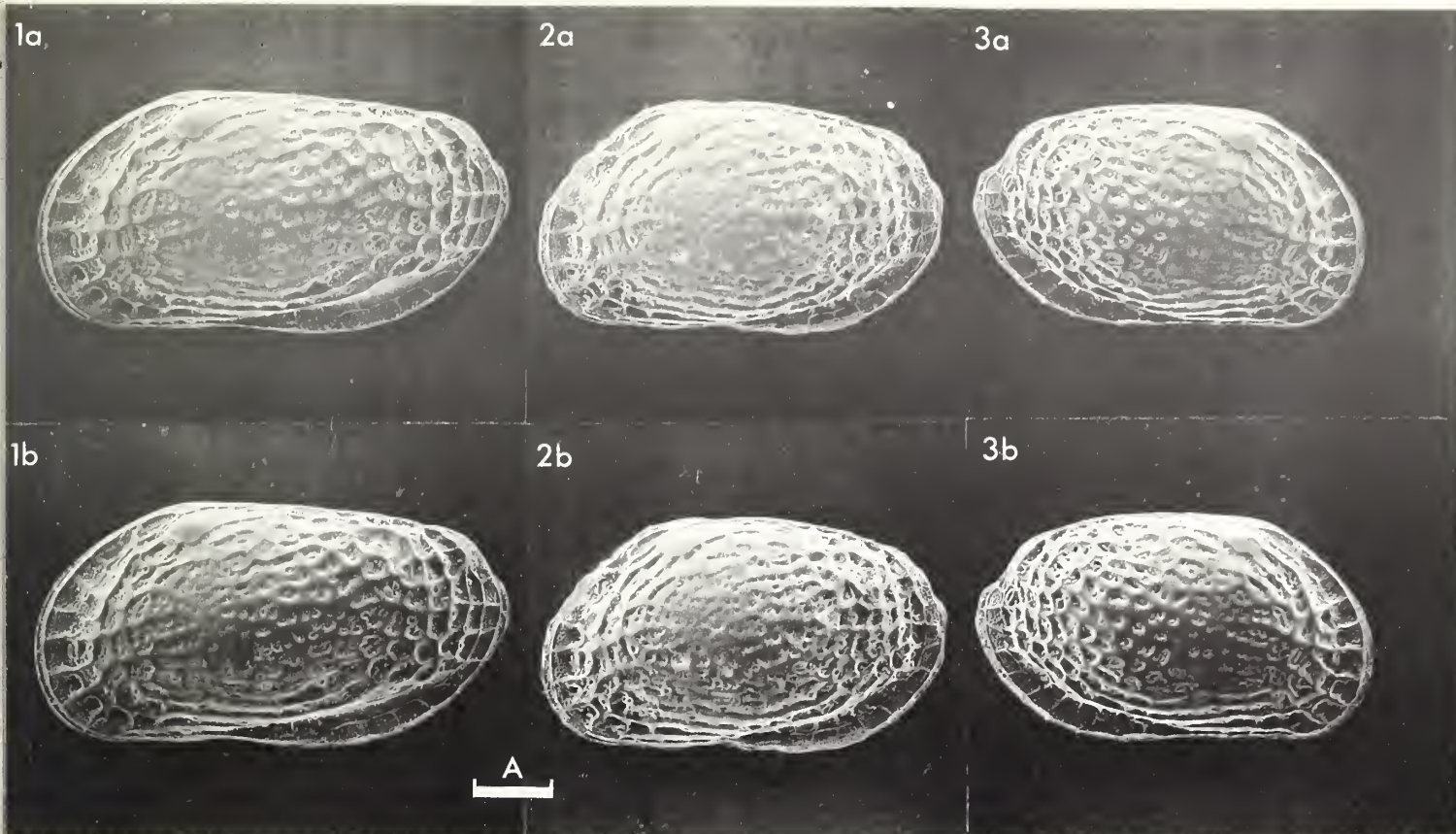
Minor differences between the male copulatory appendages of the type specimens and those of the more recently obtained examples (see text-figs. 2a-b) are regarded as intraspecific variations, and may even be due to disturbance of the appendages during dissection.

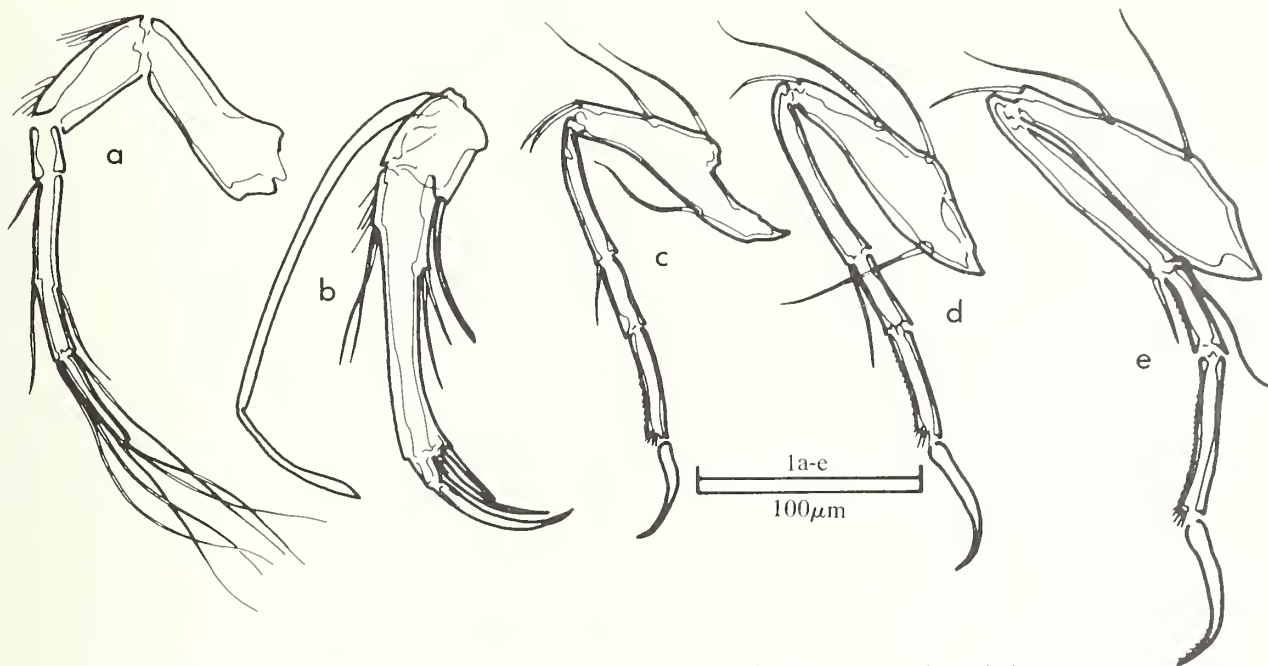
Distribution: Recent: known only from the intertidal zone of Tenerife (Hartmann, *op. cit.*, and herein).

Explanation of Plate 9, 30

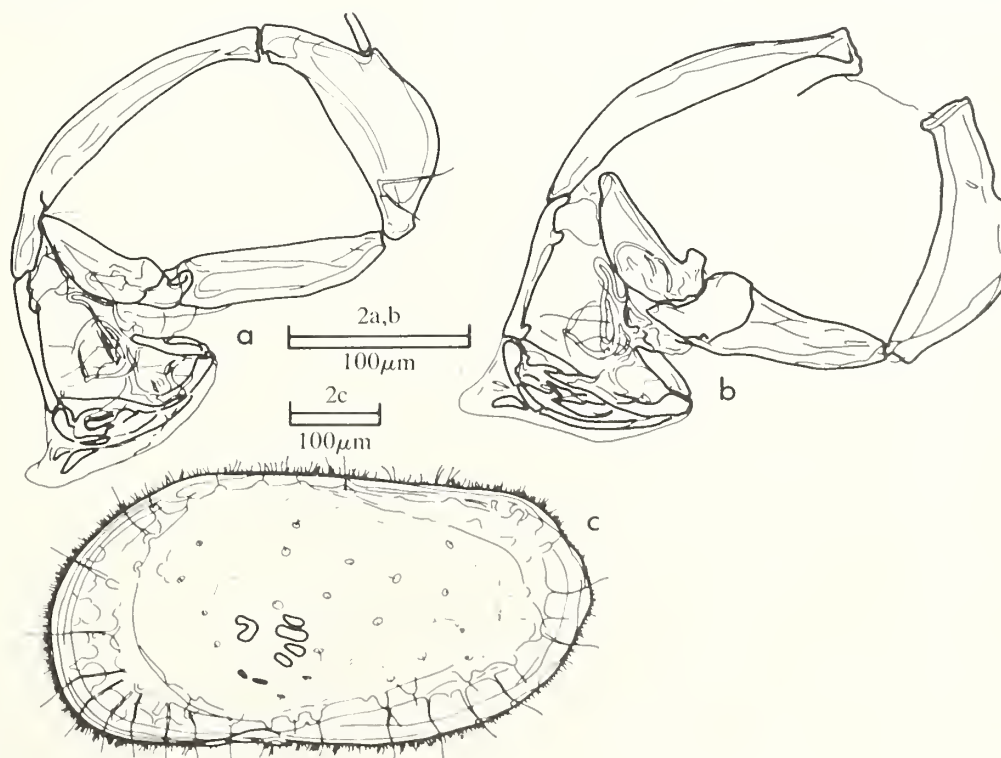
Fig. 1, ♂ LV, ext. dors. (**1982.32**, 580 µm long); fig. 2, ♂ LV, int. lat. (**1982.35**, 590 µm long); fig. 3, ♀ LV, ext. dors (**1982.33**, 490 µm long); fig. 4, ♀ LV, int. lat. (**1982.36**, 500 µm long); fig. 5, ♂ LV ext. lat., detail of dorsal marginal area showing ornament and sieve pores, (**1982.32**).

Scale A (100 µm; x 110), figs. 1-4; scale B (25 µm; x 700), fig. 5.





Text-fig. 1. ♂ appendages (1982.35). a: 1st antenna; b: 2nd antenna; c-e: thoracic legs.



Text-fig. 2. a: ♂ copulatory appendage (lectotype; Hamburg Museum specimen); b: ♂ copulatory appendage (1982.35); c: ♂ RV (decalcified) seen in transmitted light (syntype, Hamburg Museum no. K-28132).

ON *LOXOCONCHA LINLEYI* HORNE sp. nov.

by David J. Horne
(City of London Polytechnic, England)

Loxoconcha linleyi sp. nov.

- ? 1855 *Cythere maculata* sp. nov. S. Fischer, *Abh. bayer. Akad. Wiss.*, **7**, 656-658, Pl. 2, figs. 9-12 (= *nomen dubium*).
1911 *Loxoconcha impressa* (Baird); G. S. Brady, *Proc. zool. Soc. Lond.*, **27**, 595 (*pars*).
1959 *Loxoconcha dimorpha* sp. nov. G. Hartmann, *Zool. Anz.*, **162**, (*pars*), 163-166, text-figs. 10, 11, 14, 15, 20 only; (*non* text-figs. 12, 13, 16, 17, 18).

Holotype: A male carapace + appendages (split into valves and dissected), Brit. Mus. (Nat. Hist.) **1982.37**.
[Paratypes: a female carapace, split into valves, **1982.38**; and a male carapace + appendages, split into valves and dissected, **1982.39**].

Type locality: El Medano, Tenerife, Canary Islands, approx. lat. 28° 15' N, long. 16° 35' W; intertidal, Recent.

Derivation of name: After Mike Linley, who collected the sample in which this species was first recognised.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **1982.37** (holotype, ♂ car.; RV: Pl. **9**, 34, figs. 1, 3; LV: Pl. **9**, 38, fig. 3), **1982.38** (♀ car.; RV: Pl. **9**, 34, figs. 2, 4; LV: Pl. **9**, 38, fig. 2, Pl. **9**, 40, fig. 1), **1982.39** (♂ appendages: Text-figs. 1a-e, 2a), **1982.40** (♀ RV: Pl. **9**, 36, figs. 1, 2), **1982.41** (♂ RV: Pl. **9**, 36, fig. 3), **1982.42** (♀ LV: Pl. **9**, 38, fig. 1), **1982.43** (♀ LV: Pl. **9**, 40, fig. 3), **1982.44** (♂ RV: Pl. **9**, 40, fig. 2), **1982.45** (♂ copulatory appendage: Text-fig. 2b). Nos. **1982.37-42** were collected alive from intertidal algae at the type locality by M. Linley in 1980. Nos. **1982.43-45**, taken from slide no. **1911.11.8. M3454** in the Norman Collection at the Brit. Mus. (Nat. Hist.), were collected by A. M. Norman between tidemarks on the island of Madeira in spring, 1897, (approx. lat. 32° 45' N, long. 17° 00' W).

Explanation of Plate 9, 34

Figs. 1, 3, ♂ RV (holotype, **1982.37**, 560 µm long), fig. 1, ext. lat.; fig. 3, ext. dors.; figs. 2, 4, ♀ RV (paratype, **1982.38**, 510 µm long), fig. 2, ext. lat.; fig. 4, ext. dors. Scale A (100 µm; x 120), figs. 1-4.

Diagnosis: Carapace rather quadrate in lateral view. Dimorphic, male more elongate and with a straighter dorsal margin than the female. Finely pitted ornament becoming coarser posteriorly and developing marginally into reticulation, especially in the posterodorsal region. In dorsal view, greatest width at about mid-length. Male copulatory appendages of typical *Loxoconcha* shape: the broadly triangular head-piece about two-thirds the size of the basal part, with an acutely rounded posterior corner and a rounded, tooth-like process at the anterior (distal) corner.

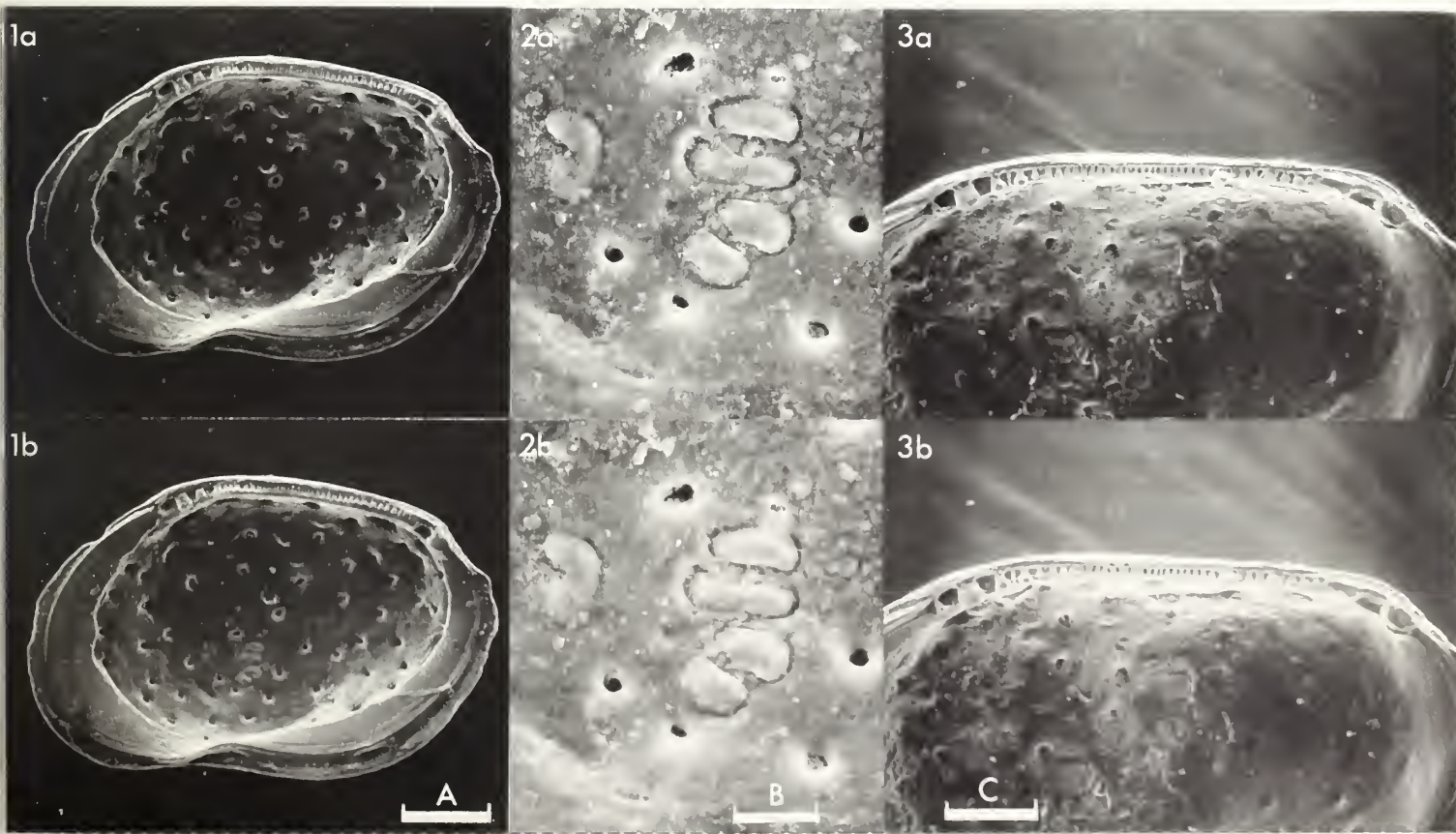
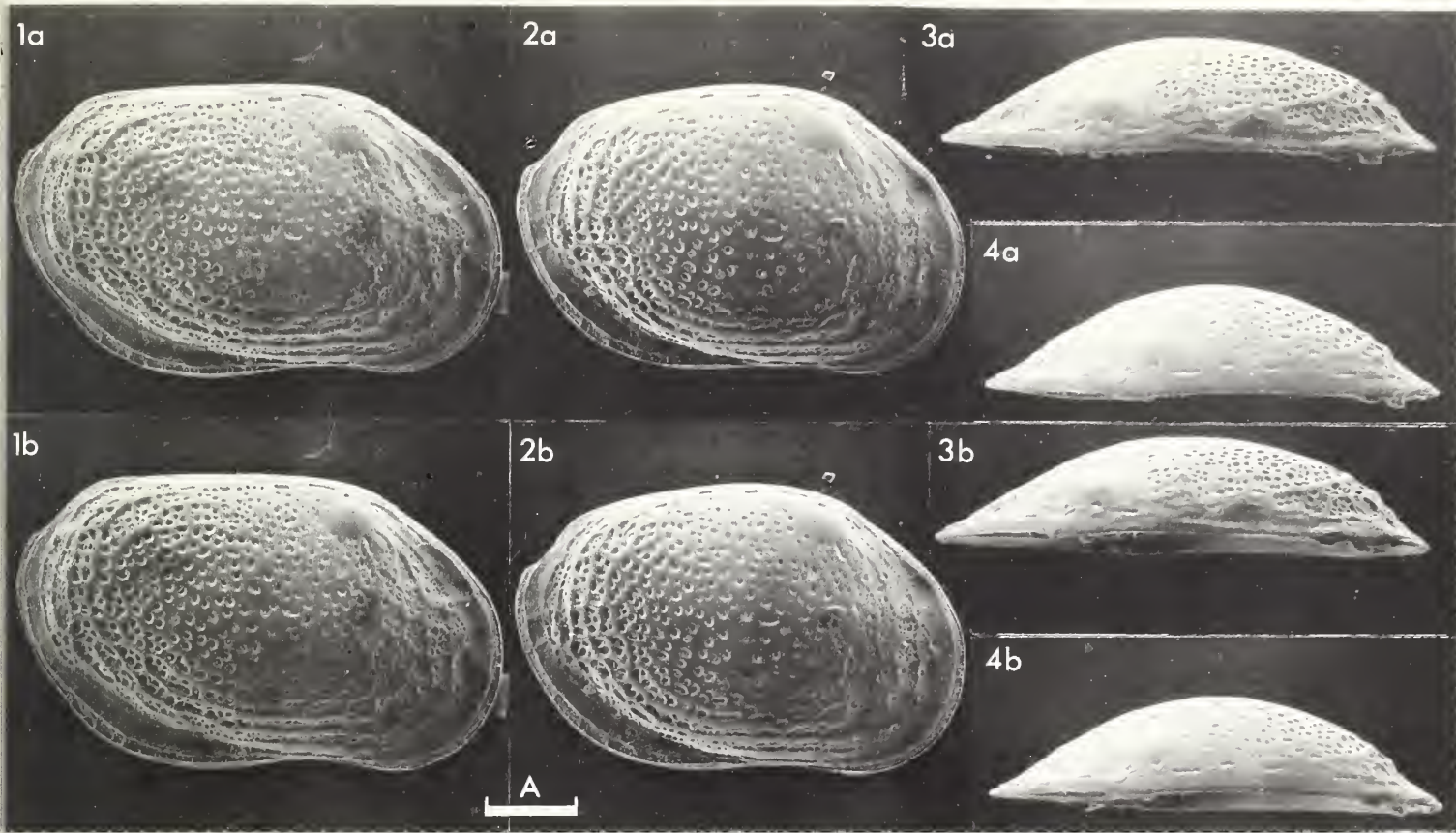
Remarks: Female specimens of *L. linleyi* were erroneously described and figured by Hartmann (*op. cit.*) as the female of *Loxoconcha dimorpha* Hartmann 1959 (see Horne 1982, *Stereo-Atlas of Ostracod Shells*, **9**, (5) 27-32, 1982). Specimens from Madeira in the Brit. Mus. (Nat. Hist.), collected by A. M. Norman and identified by G. S. Brady as *Loxoconcha impressa* (Baird), include both *Loxoconcha rhomboidea* (Fischer) (see Athersuch & Whittaker, *Stereo-Atlas of Ostracod Shells*, **3** (17), 81-90, 1976) and *L. linleyi*. The two species are indeed very similar, but *L. linleyi* is easily distinguished from *L. rhomboidea* by its more quadrate outline, its posterodorsal reticulation, and by the detailed shape of the male copulatory appendages.

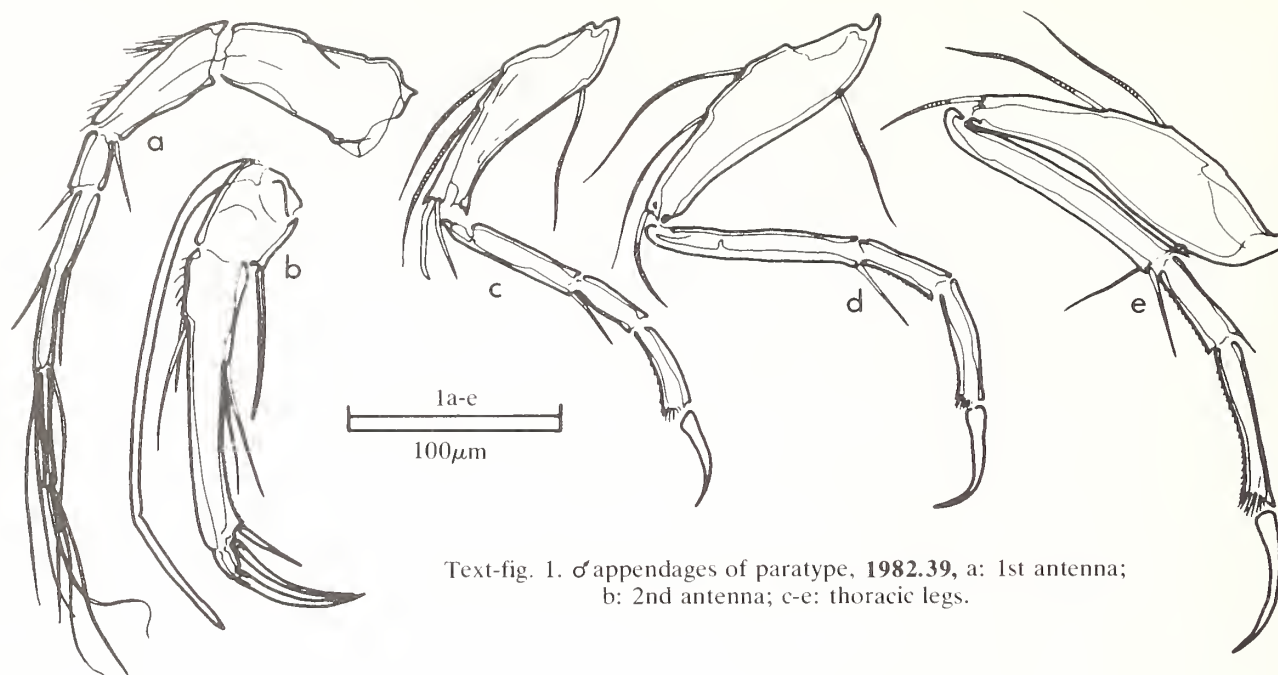
Cythere maculata Fischer 1855, described from Madeira, might possibly be conspecific with *L. linleyi*. Unfortunately Fischer's illustrations are so poor as to make a confident identification impossible, and in the absence of any type specimens it must be regarded as *nomen dubium*. Specimens of *L. linleyi* from Madeira are somewhat thicker-shelled, and the females have less strongly arched dorsal margins, than those from the type locality; minor differences are also apparent between the male copulatory appendages of specimens from the two islands (see text-figs. 2a-b). These variations are presently regarded as intraspecific.

Distribution: Recent: Tenerife and Madeira, intertidal (herein).

Explanation of Plate 9, 36

Figs. 1, 2, ♀ RV (**1982.40**, 530 µm long), fig. 1, int. lat.; fig. 2, int. musc. sc.; fig. 3, ♂ RV, int. hinge (**1982.41**). Scale A (100 µm; x 120), fig. 1; scale B (25 µm; x 440), fig. 2; scale C (50 µm; x 240), fig. 3.



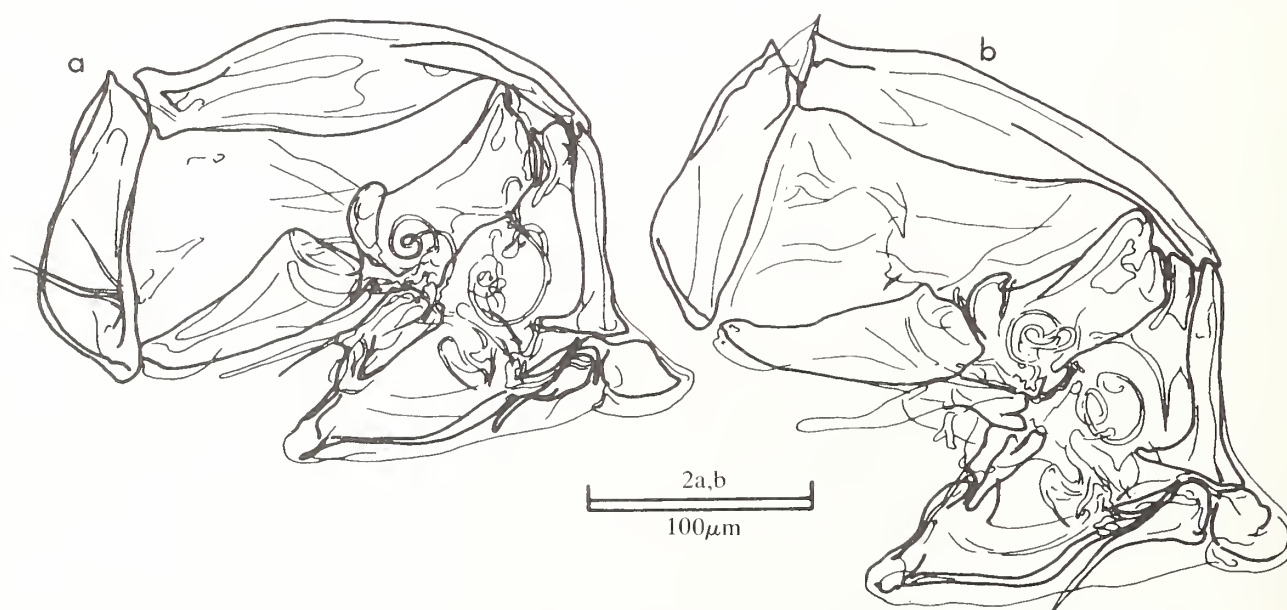


Text-fig. 1. ♂ appendages of paratype, **1982.39**, a: 1st antenna; b: 2nd antenna; c-e: thoracic legs.

Explanation of Plate 9, 38

Fig. 1, ♀ LV, int. lat. (**1982.42**, 520 µm long); fig. 2, ♀ LV, ext. lat. (paratype, **1982.38**, 520 µm long); fig. 3, ♂ LV, ext. lat. (holotype, **1982.37**, 560 µm long).

Scale A (100 µm; x 120), figs. 1-3.

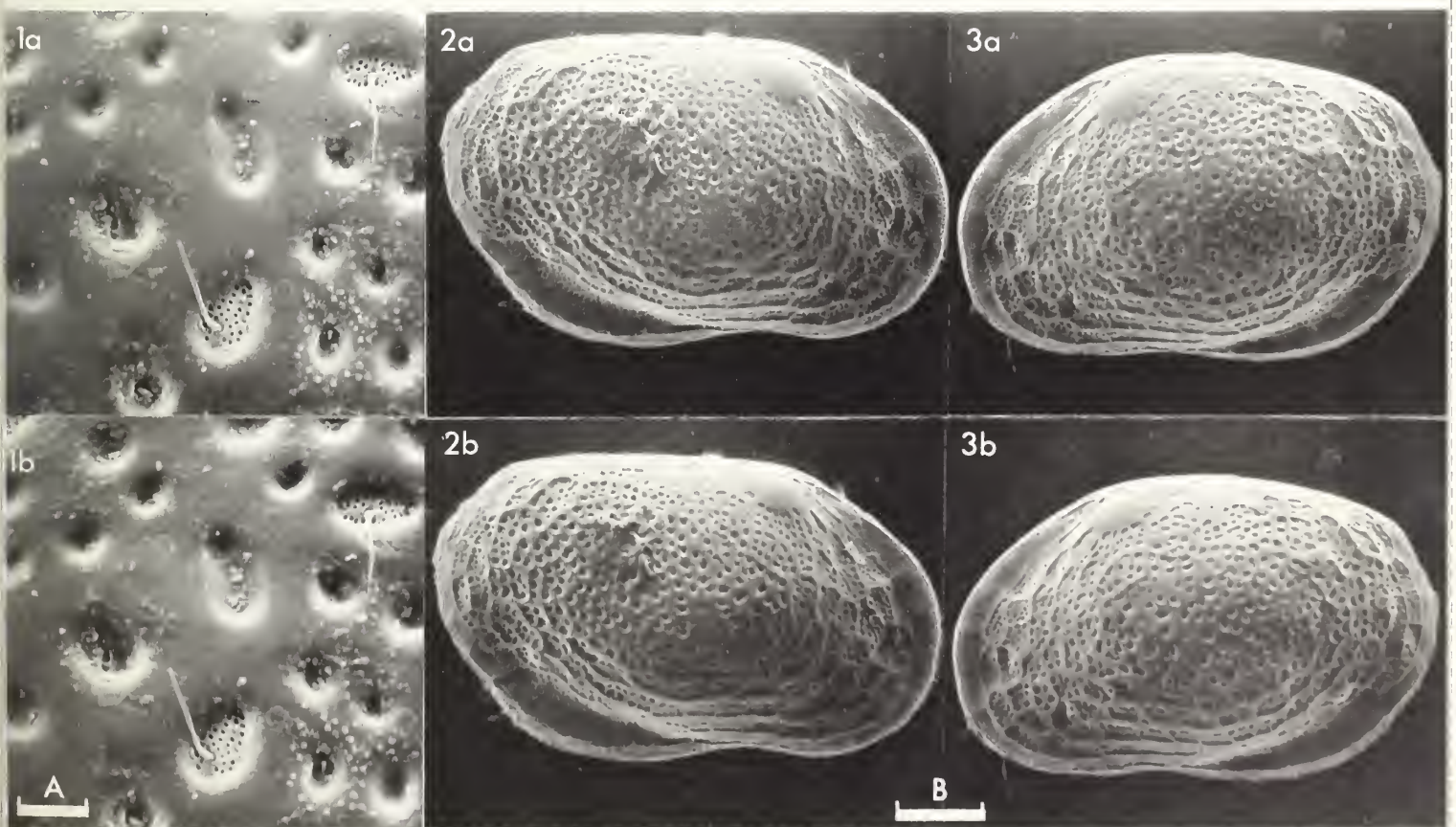
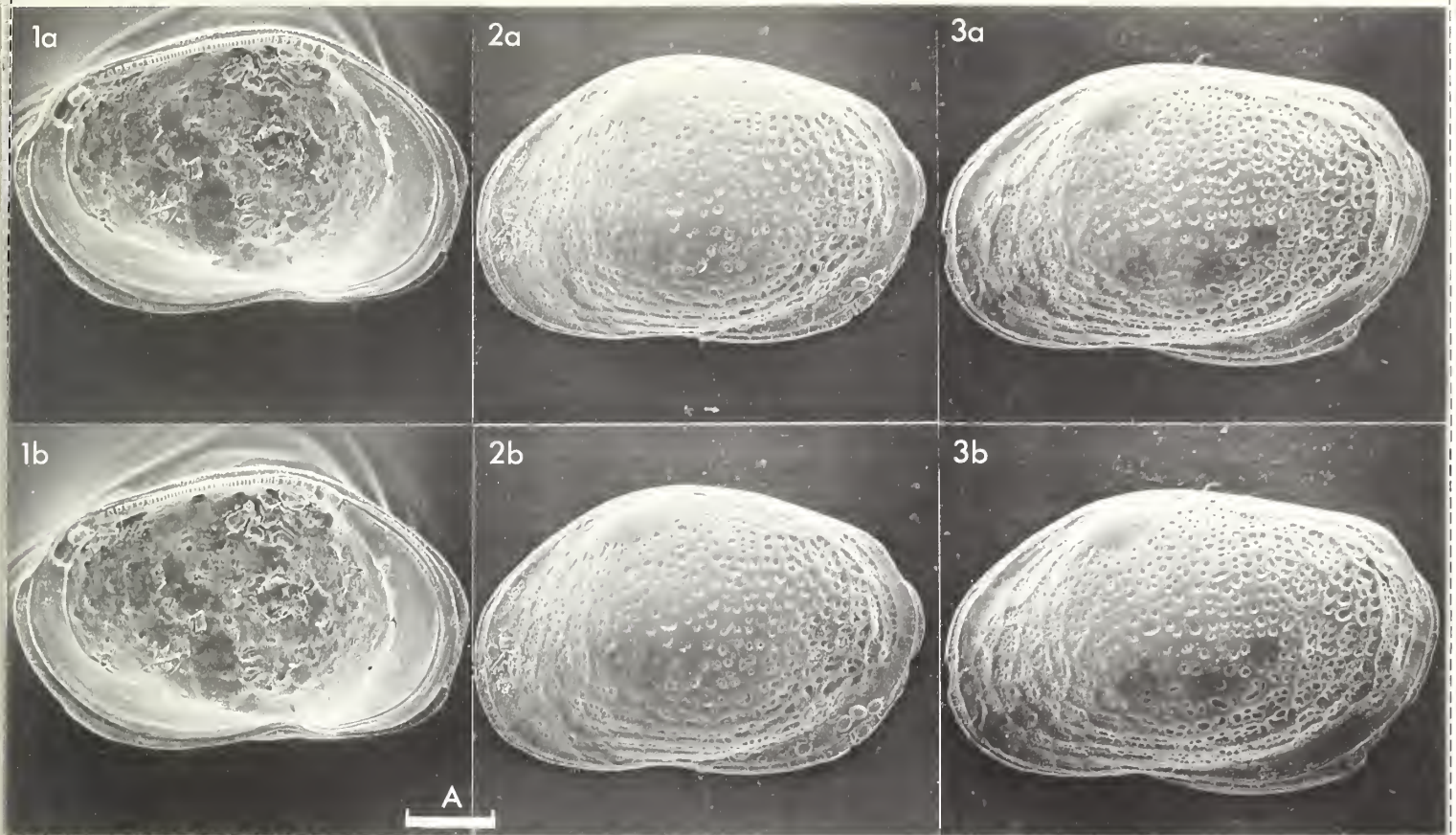


Text-fig. 2. ♂ copulatory appendages. a: (paratype, **1982.39**), from Tenerife; b: (**1982.45**) from Madeira.

Explanation of Plate 9, 40

Fig. 1, ♀ LV, ext. lat., detail of central region showing sieve-pores (paratype, **1982.38**); fig. 2, ♂ RV, ext. lat. (**1982.44**, 580 µm long); fig. 3, ♀ LV, ext. lat. (**1982.43**, 550 µm long).

Scale A (10 µm; x 950), fig. 1; scale B (100 µm; x 120), figs. 2, 3.



ON *WAIPARACYTHEREIS JOANAE* SWANSON

by Kerry Swanson
(University of Canterbury, New Zealand)

Waiparacythereis joanae Swanson, 1969

- 1969 *Waiparacythereis joanae* K. M. Swanson, Trans. Roy. Soc. N.Z., Earth Sci. 7(3), 41, pl. 2, figs. 36-38.
1979 *Waiparacythereis joanae* K. M. Swanson, N.Z. Oceanographic Inst. Memoir 78, 28, fig. 33.
1979 *Waiparacythereis joanae* K. M. Swanson, N.Z. Journ. Marine & Freshwater Res. 13(1), 160, figs. 40-p.

Holotype: New Zealand Geological Survey no. **TO 1009**.

Type locality: M Waipara sequence, Canterbury Province, New Zealand; lat. 43° 0.5' S, long. 172° 35' E., 80ft below the top of the Gowan Hill Sandstone. Grid. ref. S68 991121. L Miocene.

Explanation of Plate 9, 42

Fig. 1, RV, ext. lat. (**UCF 1337.1**, 880µm long); fig. 2, LV, ext. lat. (**UCF 1337.1**, 900µm long).
Scale A (200µm long; x 97), fig. 1; scale B (200µm long; x 93), fig. 2.

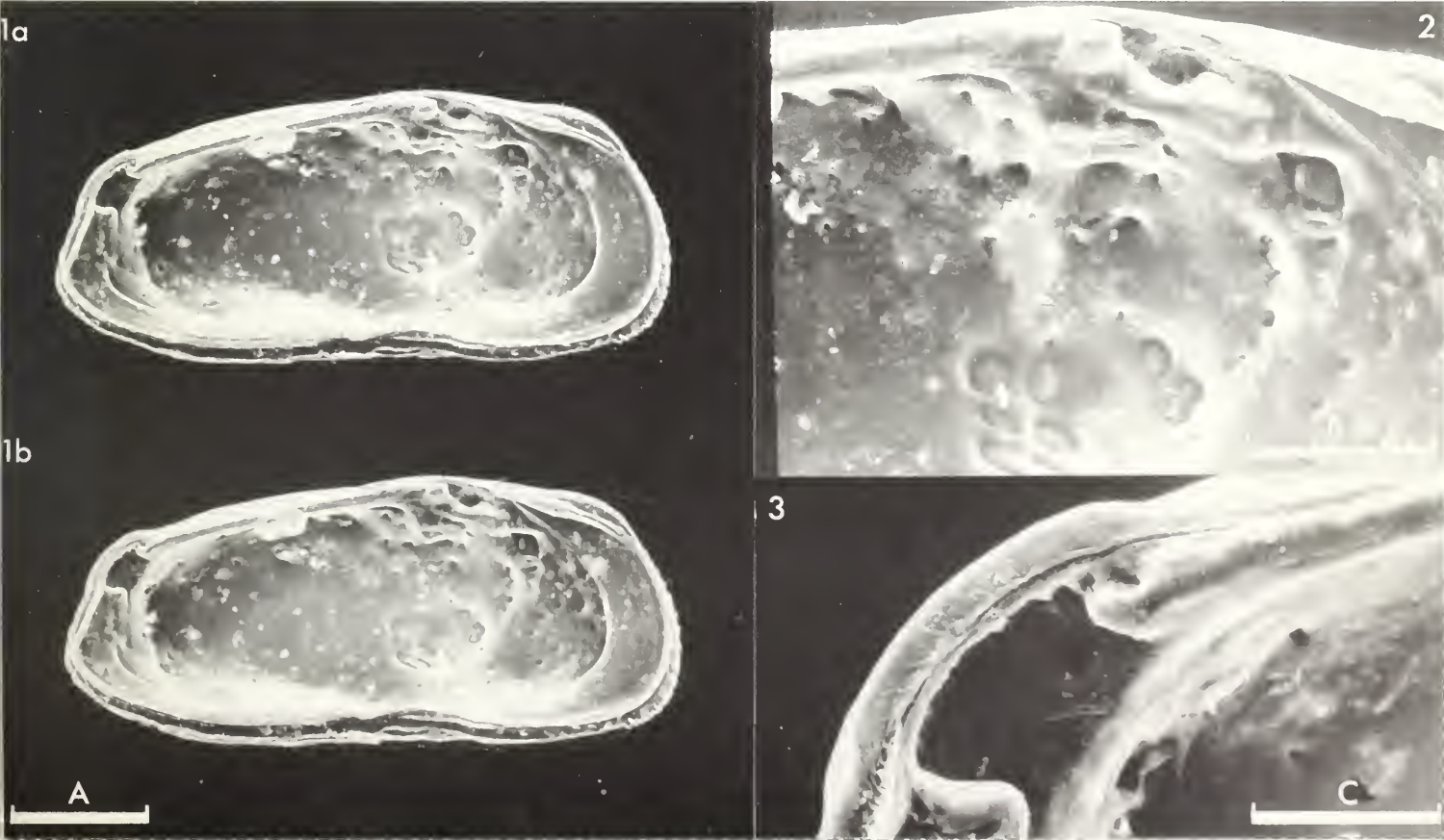
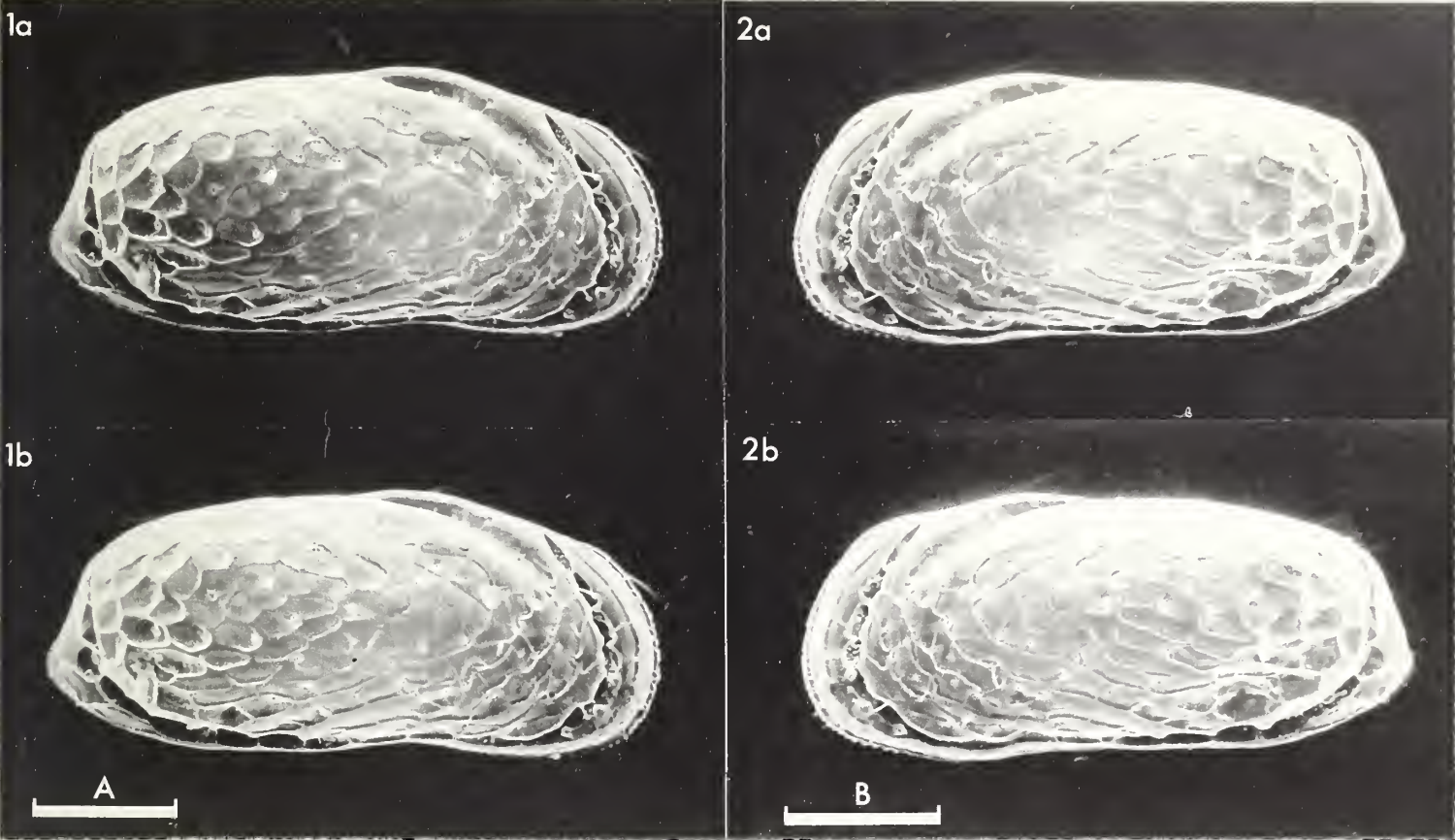
Figured specimens: University of Canterbury (Geol Dept) nos. **UCF 1337.1** (♂ car.; LV and RV: Pl. 9, 42, figs. 1-2), **UCF 1337.4** (♂ car.; LV: Pl. 9, 44, figs. 1-3), **UCF 1337.2** (♂ appendages: Text-figs. 1a-c, 2a), **UCF 1337.1** (♂ appendages: Text-figs. 2b-d). All from dredge sample (17.7 m), Otago Shelf, South Island, New Zealand; lat. 45° 55' S, long. 170° 36'E.

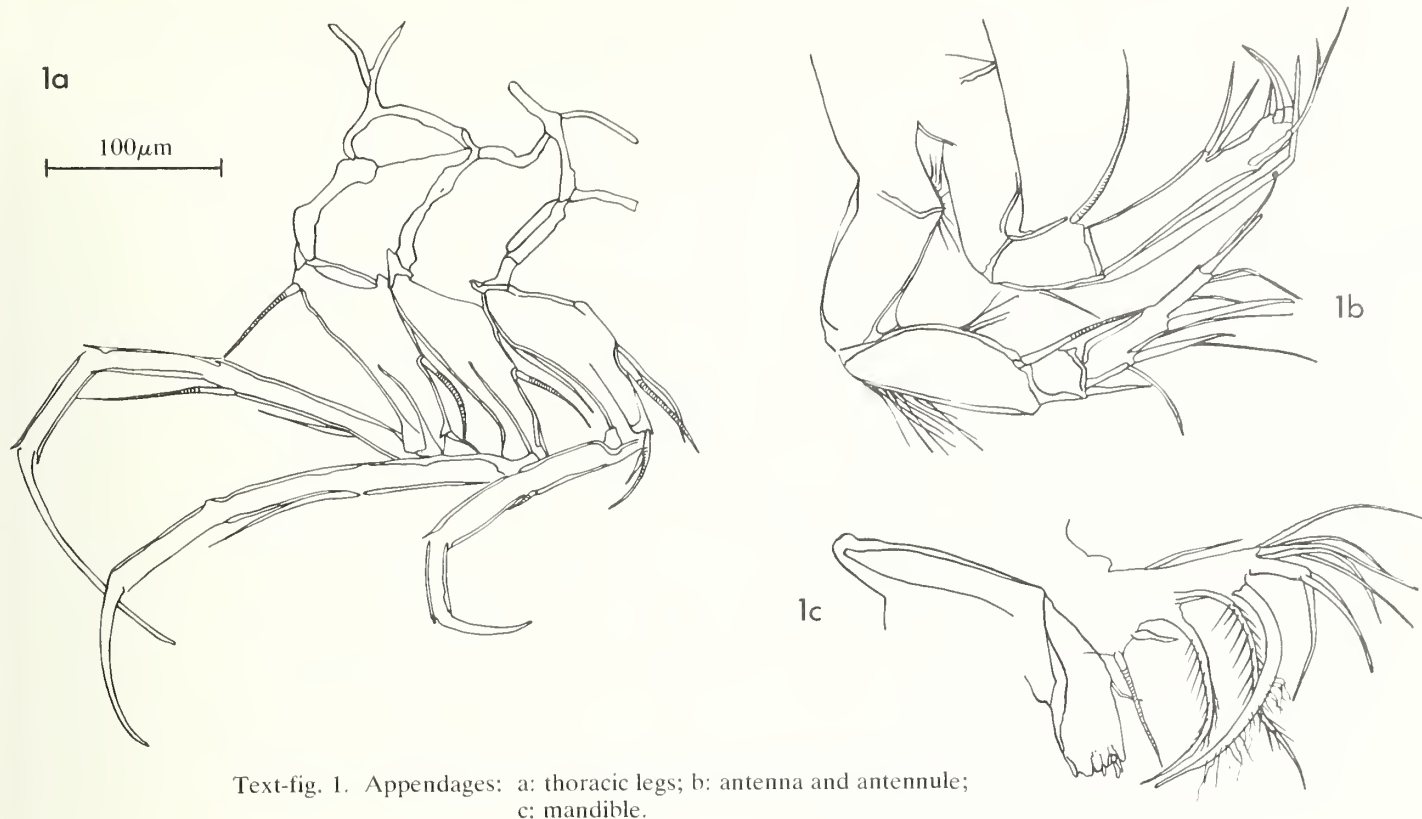
Diagnosis: Carapace large, elongate, strongly inflated posteriorly. Very heavily calcified, Surface ornamentation subdued, especially medially.

Remarks: In my original description (1969), on the basis of carapace morphology (in particular muscle scars), I felt *Waiparacythereis* to be closely related to *Urocythereis*. This decision is confirmed by the soft parts illustrated herein.

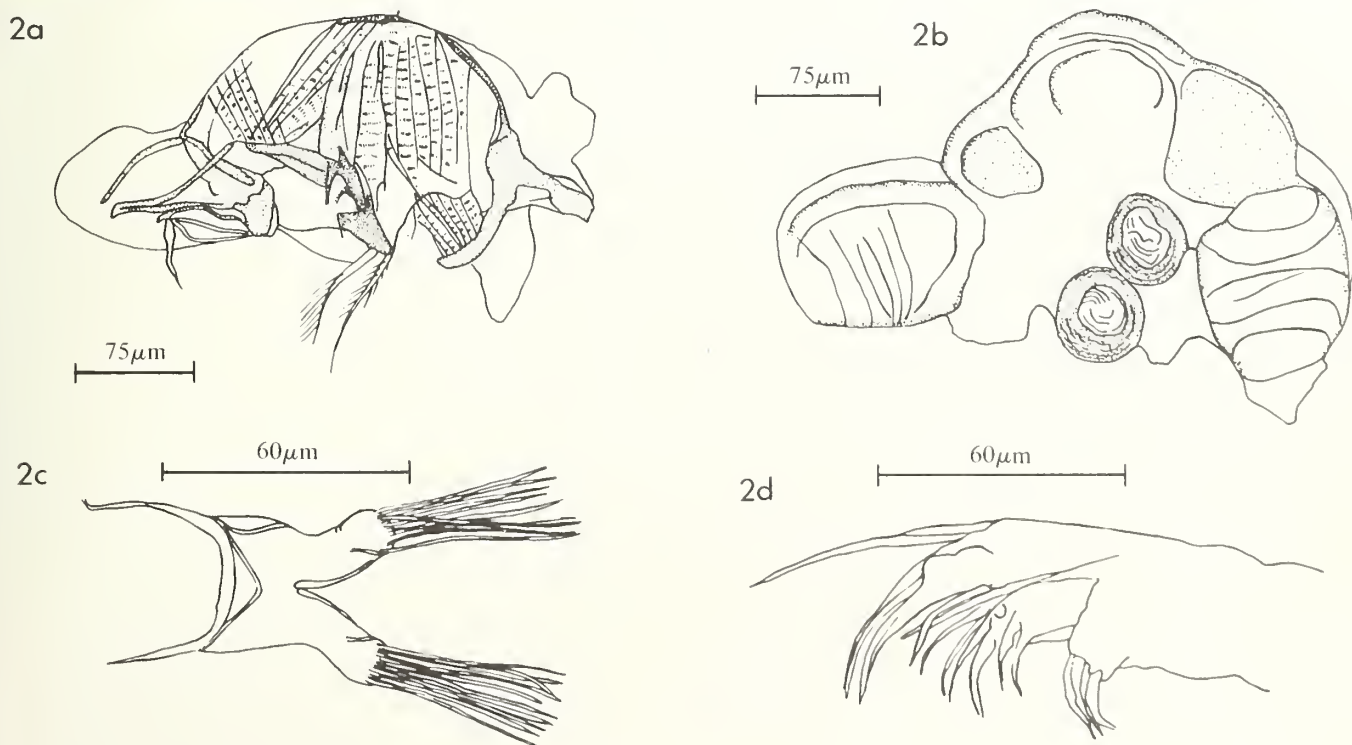
Explanation of Plate 9, 44

Fig. 1, LV, int. lat. (**UCF 1337.4**, 880µm long); fig. 2, LV, int. musc. sc. and ant. hinge (**UCF 1337.4**, 880µm long); fig. 3, LV, int. post. hinge (**UCF 1337.4**, 880µm long).
Scale A (200µm long; x 95), fig. 1; scale B (100µm long; x 215), fig. 2; scale C (50µm long; x 515), fig. 3.





Text-fig. 1. Appendages: a: thoracic legs; b: antenna and antennule; c: mandible.



Text-fig. 2. Appendages: a: copulatory apparatus; b: posterior of body; c: brush organ; d: maxilla

ON *ACANTHOCYTHEREIS DOHUKENSIS* KHALAF sp. nov.

by Saleh K. Khalaf
(University of Hull, England and University of Mosul, Iraq)

Acanthocythereis dohukensis sp. nov.

Holotype: University of Hull Coll. no. HU.275.T.1, ♂ car.
[Paratype: HU.275.T.2.5].

Type locality: Dohuk anticline, Southern limb, 10km NE Dohuk City N. Iraq. Lower Fars Formation bed no. 12;
lat. 36° 54' N, long. 43° 01' E; M Miocene.

Derivation of name: From Dohuk City, which gave its name to the Dohuk anticline, where the species was found.

Figured Specimens: University of Hull Coll. nos. HU.275.T.1 (♂ car.; LV: Pl. 9, 48, fig. 1; Pl. 9, 50, figs. 2, 3), HU.275.T.2
(♀ car.; Pl. 9, 48, fig. 2; Pl. 9, 50, fig. 1).

Diagnosis: Species of *Acanthocythereis* with well-developed surface reticulation and strong blunt spines.
Carapace subrectangular with dorsal and ventral margins converging slightly posteriorly.

Explanation of Plate 9, 48

Fig. 1, ♂ car., ext. lt. lat. (holotype, HU.275.T.1, 836µm long); fig. 2, ♀ car. ext. rt. lat. (paratype, HU.275.T.2, 788µm long).
Scale A (200µm, x 115), fig. 1; scale B (200µm; x 122), fig. 2.

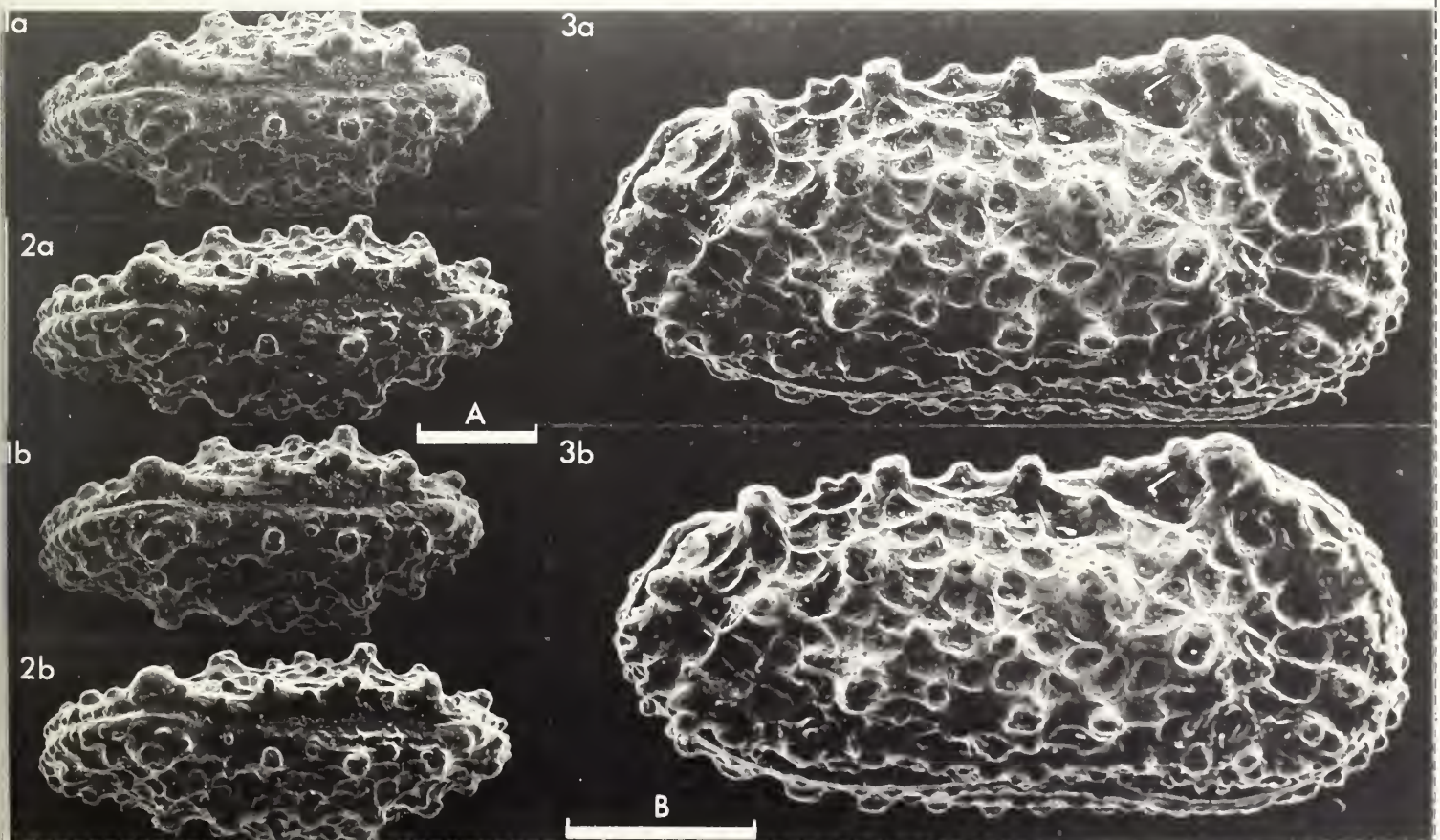
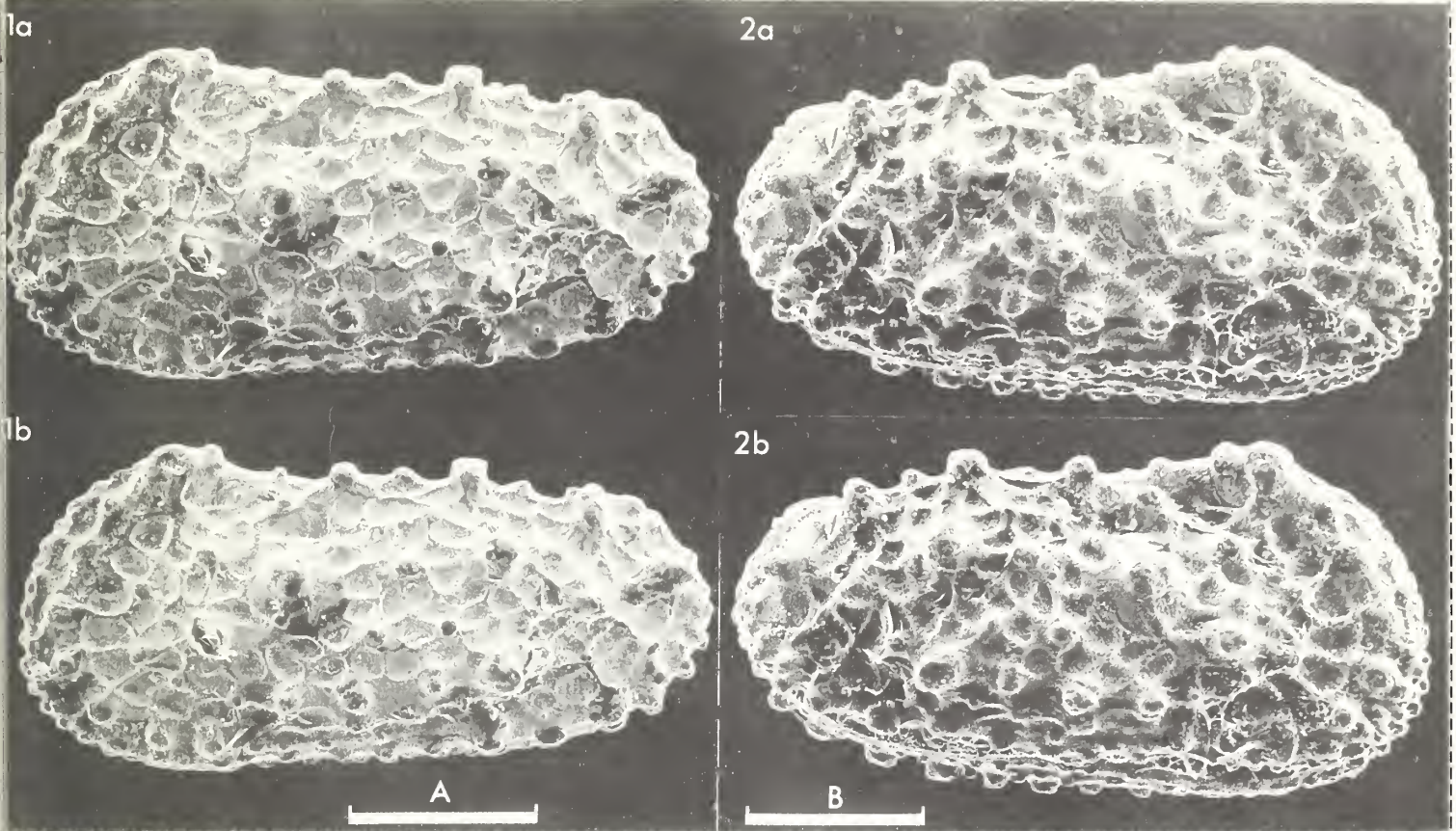
Remarks: Anterior margin broadly rounded with row of small tubercles, posterior end subtriangular. Sexual dimorphism marked, presumed males are longer and less wide than the females.

Acanthocythereis hystrix differs in having much blunter spines and the posterior margin is more subtriangular. *Trachyleberis (Acanthocythereis) procapsus* Siddiqui, 1971 is narrower and less high, has a slightly concave ventral margin anteroventrally and differs in detail of reticulation.

Distribution: This species has been found in the L Fars Formation of the Bashiqa, Sheikhan and Dohuk sections, N Iraq.

Explanation of Plate 9, 50

Fig. 1, ♀ car., dors. (paratype, HU.275.T.2, 788µm long); figs. 2, 3, ♂ car. (holotype, HU.275.T.1, 836µm long): fig. 2, dors.; fig. 3, ext. rt. lat.
Scale A (200µm; x 79), figs. 1, 2; scale B (200µm; x 133) fig. 3.



ON *ACTINOCYHEREIS IRAQENSIS* KHALAF sp. nov.

by Saleh K. Khalaf
(University of Hull, England and University of Mosul, Iraq)

Actinocythereis iraqensis sp. nov.

Holotype: University of Hull Coll. no. **HU.275.T.6**, ♂ car.

[Paratypes: **HU.275.T.7-12**].

Type locality: Sheikh Ibrahim anticline, southern limb, NW Iraq, 45 km west of Mosul. Lower Fars Formation bed No. 50 M; lat. 36° 18' N, long. 42° 39' E; Miocene.

Derivation of name: From its abundant occurrence in the M Miocene of Iraq.

Figured specimens: University of Hull Coll. nos. **HU.275.T.6** (♂ car.; RV: Pl. 9, 52, fig. 1), **HU.275.T.7** (♀ car.; RV: Pl. 9, 52, fig. 2; Pl. 9, 54, fig. 2), **HU.275.T.8** (♀ LV, int. lat.: Pl. 9, 54, fig. 1).

Diagnosis: A thick-shelled species of *Actinocythereis*, subrectangular in lateral view with greatest height at the eye tubercle; surface strongly ornamented with different sized tubercles, well developed marginal rim with small tubercles.

Explanation of Plate 9, 52

Fig. 1, ♂ car., ext. rt. lat. (holotype, **HU.275.T.6**, 1092 µm long); fig. 2, ♀ car., ext. rt. lat. (paratype, **HU.275.T.7**, 916 µm long). Scale A (200 µm; x 90), fig. 1; scale B (200 µm; x 103), fig. 2.

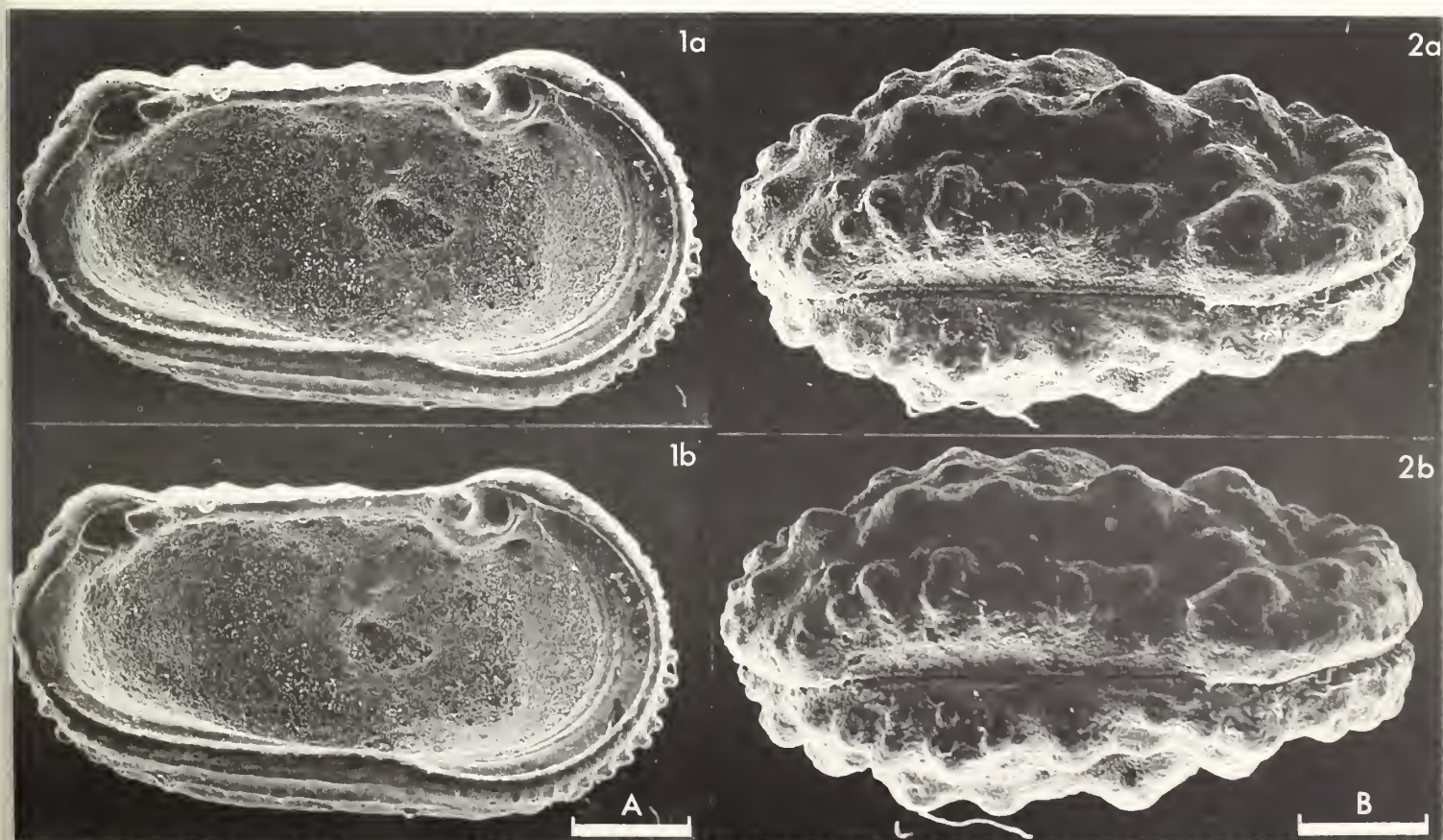
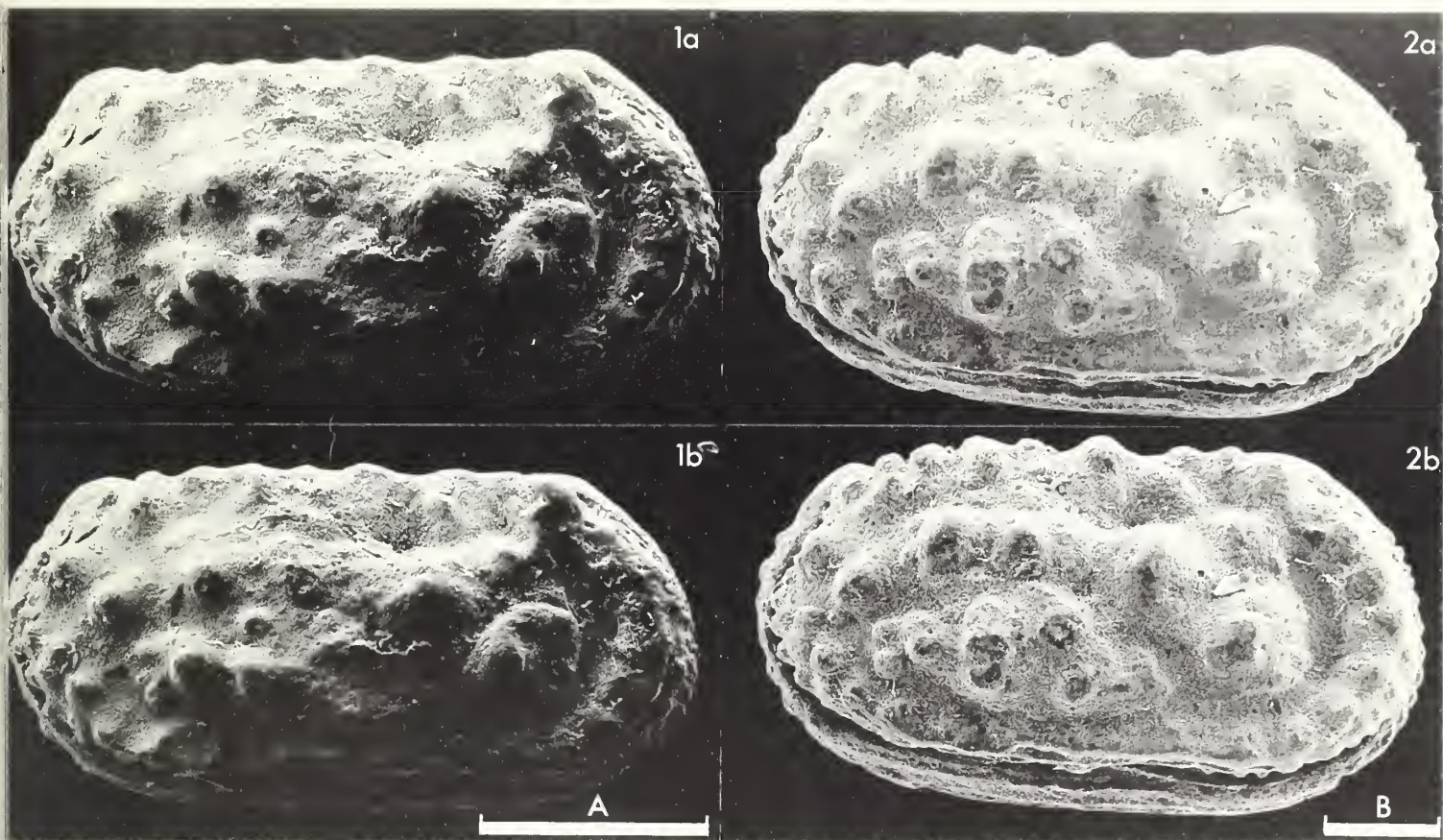
Remarks: The present species shows affinities with *Actinocythereis tumefacensis* (Lyubimova and Guha, 1960) but differs in that the ventral margin of the latter species is strongly concave medially and the posterior end is more rounded than that of *A. iraqensis*. This species differs from *Trachyleberis* (*Actinocythereis*) *birmanica pyawbwe* Gramann, 1975 which is narrower posteriorly.

This species occurs abundantly and shows many of the features typical of *Actinocythereis*. The dorsal and ventral margins are nearly straight and subparallel, the anterior end rounded with distinct marginal rim and the posterior end is subrectangular. The surface is coarsely ornamented with different sized tubercles, and the distinctive median row starts anteroventrally and runs in a dorsally convex arch to the posteroventral part of the valve. This is a very common species in the M Miocene of Iraq and is often accompanied by *Hermanites transversicostata* and *Chrysocythere naqibi*.

Distribution: *A. iraqensis* is very common in the M Miocene of Iraq in the Bashiqa, Sheikhan, Dohuk, Sheikh Ibrahim, Tel. Hajer, Kirkuk and Hamerin sections.

Explanation of Plate 9, 54

Fig. 1, ♀ LV, int. lat. (paratype, **HU.275.T.8**, 956 µm long); fig. 2, ♂ car., ext. dors. (paratype, **HU.275.T.7**, 916 µm long). Scale A (200 µm; x 102), fig. 1; scale B (200 µm; x 100), fig. 2.



ON *CHRYSOCY THERE NAQIBI* KHALAF sp. nov.

by Saleh K. Khalaf

(University of Hull, England and University of Mosul, Iraq)

Chrysocythere naqibi sp. nov.

Holotype: University of Hull Cell. no. **HU.275.T.13**, ♀ car.

[*Paratype*: **HU.275.T.14**, ♂ car.].

Type locality: Sheikh Ibrahim anticline, southern limb, NW Iraq, 145 km west of Mosul, Lower Fars Formation, bed no. 50; M Miocene: lat. 36° 18' N, long. 42° 39' E.

Derivation of name: In the honour of the late Iraqi geologist, Khorshid M. Al. Naqib, in recognition of his extensive contributions to the Iraqi geology.

Figured specimens: University of Hull Coll. nos. **HU.275.T.13** (holotype, ♀ car.: Pl. 9, 56, fig. 1; Pl. 9, 58, fig. 1), **HU.275.T.14** (♂ car.: Pl. 9, 56, fig. 2; Pl. 9, 58, fig. 2).

Diagnosis: Three longitudinal ridges, the dorsal and median are connected by a short curved transverse ridge at about one third length from anterior end. The median ridge runs in an elegantly curved, convex upward arc from middle of anterior margin towards middle of posterior end. The rest of the surface is ornamented with thick, short transverse ridges.

Explanation of Plate 9, 56

Fig. 1, ♀ car., ext. rt. lat. (holotype, **HU.275.T.13**, 904 µm long); fig. 2, ♂ car., ext. lt. lat. (paratype, **HU.275.T.14**, 992 µm long). Scale A (200 µm; x 105), fig. 1; scale B (200 µm; x 93), fig. 2.

Remarks: The species is characterised by a distinctive type of ornamentation, the thick transverse ridges which connect the median and ventral ridges forming distinctive reticulæ; two rounded reticulæ alternate in the anterior part of the median ridge. Sexual dimorphism is very marked, the presumed male being longer and narrower than the female.

The present species differs from *Chrysocythere paradisus* Doruk, 1973, which is more elongate and differs in details of the reticulum.

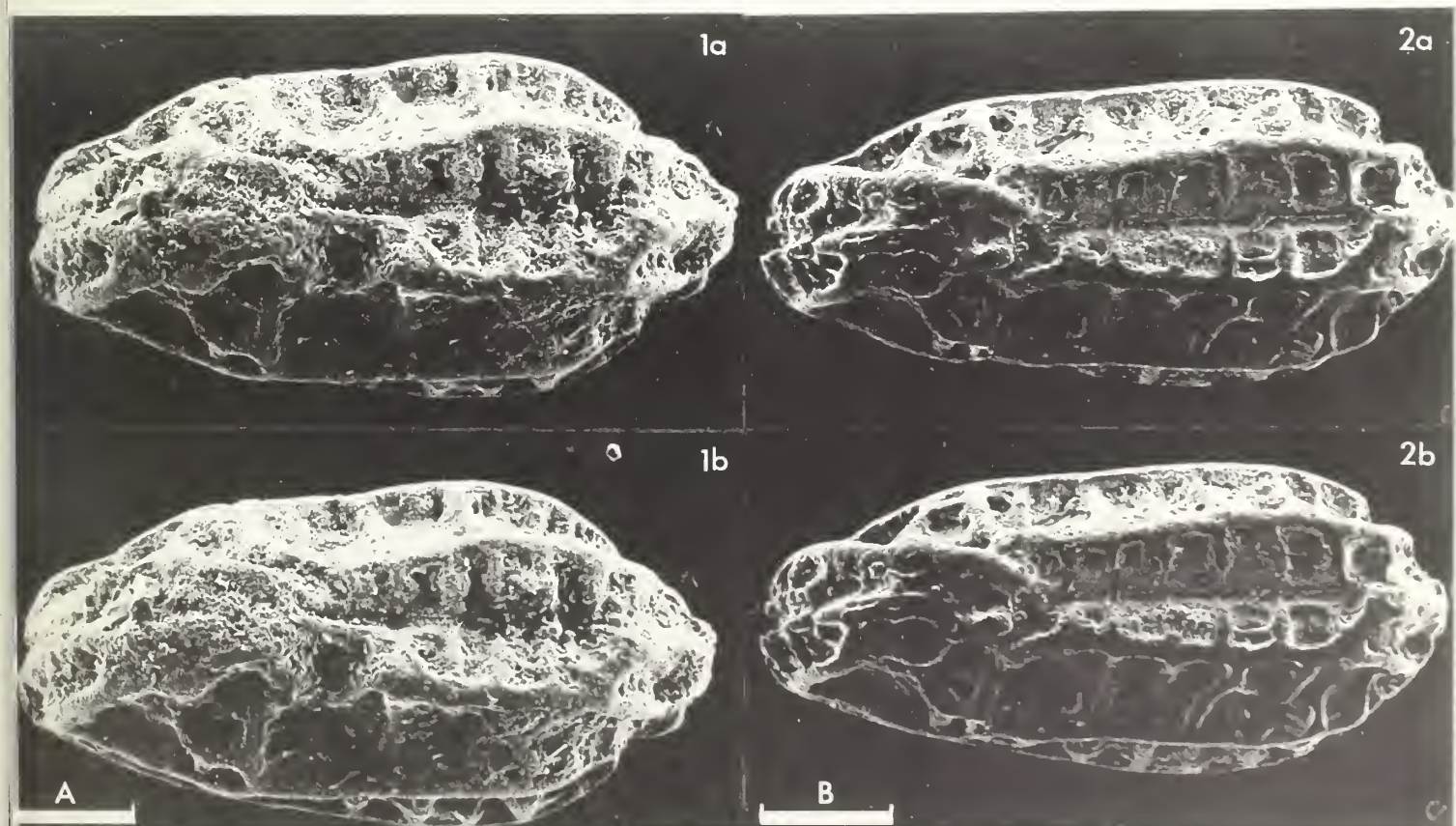
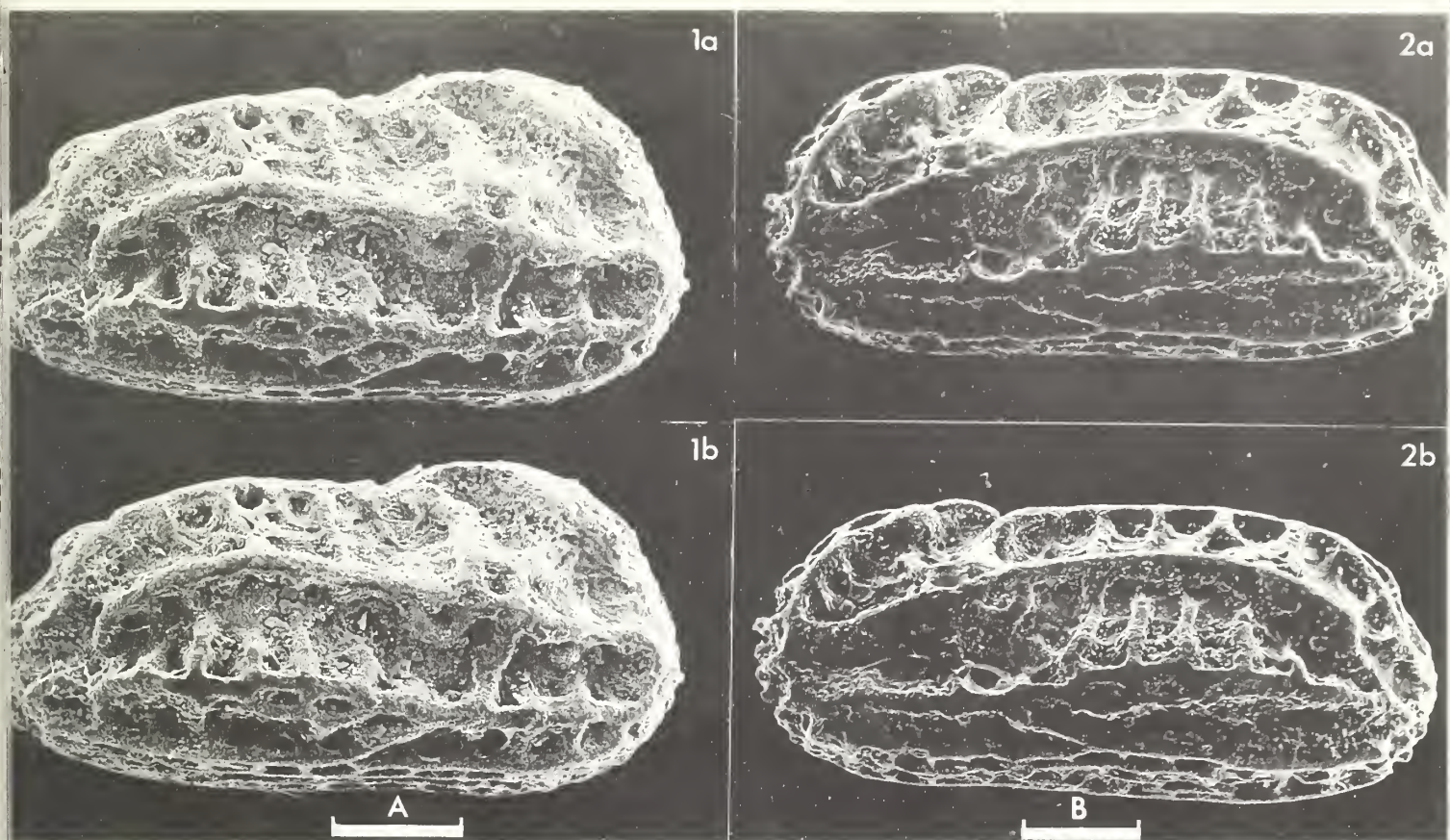
C. naqibi is more elongate than *C. cataphracta*, Ruggieri, 1962, and differs in detail of the reticulation.

The new subspecies of *C. cataphracta* described from the M Miocene in the Mersin of Turkey by Bassiouni, 1980 shows some similarity in ornamentation but the present species differs in the development of an additional longitudinal ridge below the ventral ridge which is joined to the latter and follows a curved path in the posterior two-thirds of the shell.

Distribution: *C. naqibi* occurs in the M Miocene sections of Sheikh Ibrahim anticline, NW Iraq where it is associated with *Hermanites transversicostata* Khalaf (*Stereo-Atlas of Ostracod Shells*, 9, 59-62, 1982) and *Actinocythereis iraqensis* Khalaf (*Ibid.*, 51-54).

Explanation of Plate 9, 58

Fig. 1, ♀ car., ext. dors. (holotype, **HU.275.T.13**, 904 µm long); fig. 2, ♂ car., ext. dors. (paratype, **HU.275.T.14**, 992 µm long). Scale A (200 µm; x109), fig. 1; scale B (200 µm; x 102), fig. 2.



ON *HERMANITES TRANSVERSICOSTATA* KHALAF sp. nov.

by Saleh K. Khalaf
(University of Hull, England and University of Mosul, Iraq)

Hermanites transversicostata sp. nov.

Holotype: University of Hull Coll. no. **HU.275.T.15**, ♂ car.
[Paratype: **HU.275.T.16-25**].

Type locality: Sheikhan anticline, northern limb, 27 km NE of Mosul City, Northern Iraq, Lower Fars Formation, bed no. 10; M Miocene; lat. 36° 42' N, long. 43° 25' E.

Derivation of name: From the characteristic vertical transverse rib running from the posterodorsal margin about one-eighth the length from the posterior margin and sub-parallel to the latter.

Figured specimens: University of Hull Coll. nos. **HU.275.T.16** (♀ car.: Pl. 9, 60, fig. 1; Pl. 9, 62, fig. 1), **HU.275.T.15** (holotype, ♂ car.: Pl. 9, 60, fig. 2; Pl. 9, 62, fig. 2).

Diagnosis: A species of *Hermanites* with curved dorsal ridge joined posteriorly with a short, vertical transverse ridge and ending in a small node. Surface ornamented with strong reticulation, well-developed eye tubercle and steeply inclined posterior margin.

Explanation of Plate 9, 60

Fig. 1, ♀ car., ext. lt. lat. (paratype, **HU.275.T.16**, 824 μm long), fig. 2, ♂ car., ext. lt. lat. (holotype, **HU.275.T.15**, 992 μm long). Scale A (200 μm; x 107), fig. 1; scale B (200 μm; x 94), fig. 2.

Remarks: Surface ornamented with well-developed reticulae, dorsal ridge joined by the short posteriorly transverse ridge. Anterior end of the ventral ridge is joined to the sub-central tubercle by a short curved ridge. The reticulae at the anterior margin are sub-rectangular.

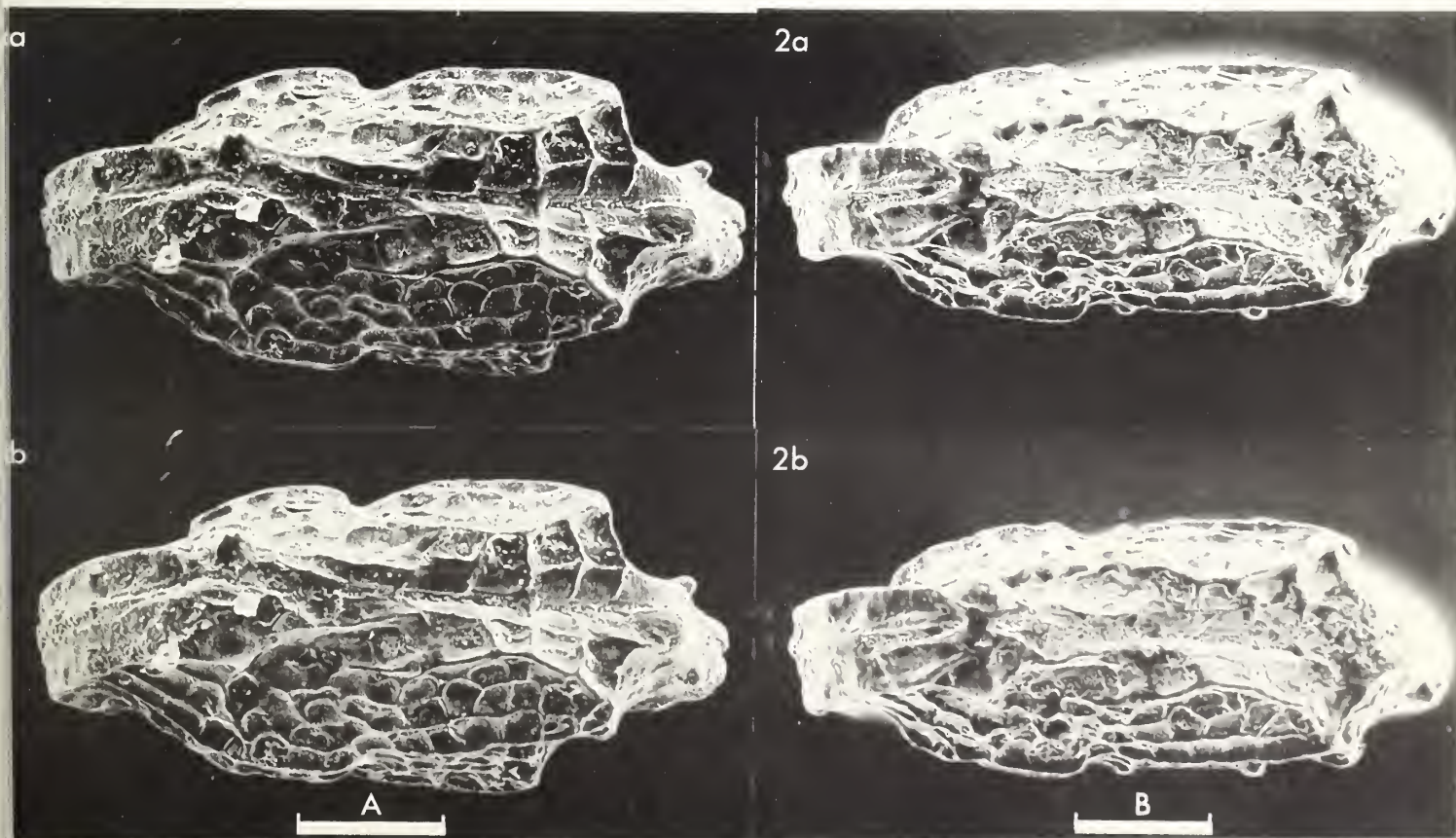
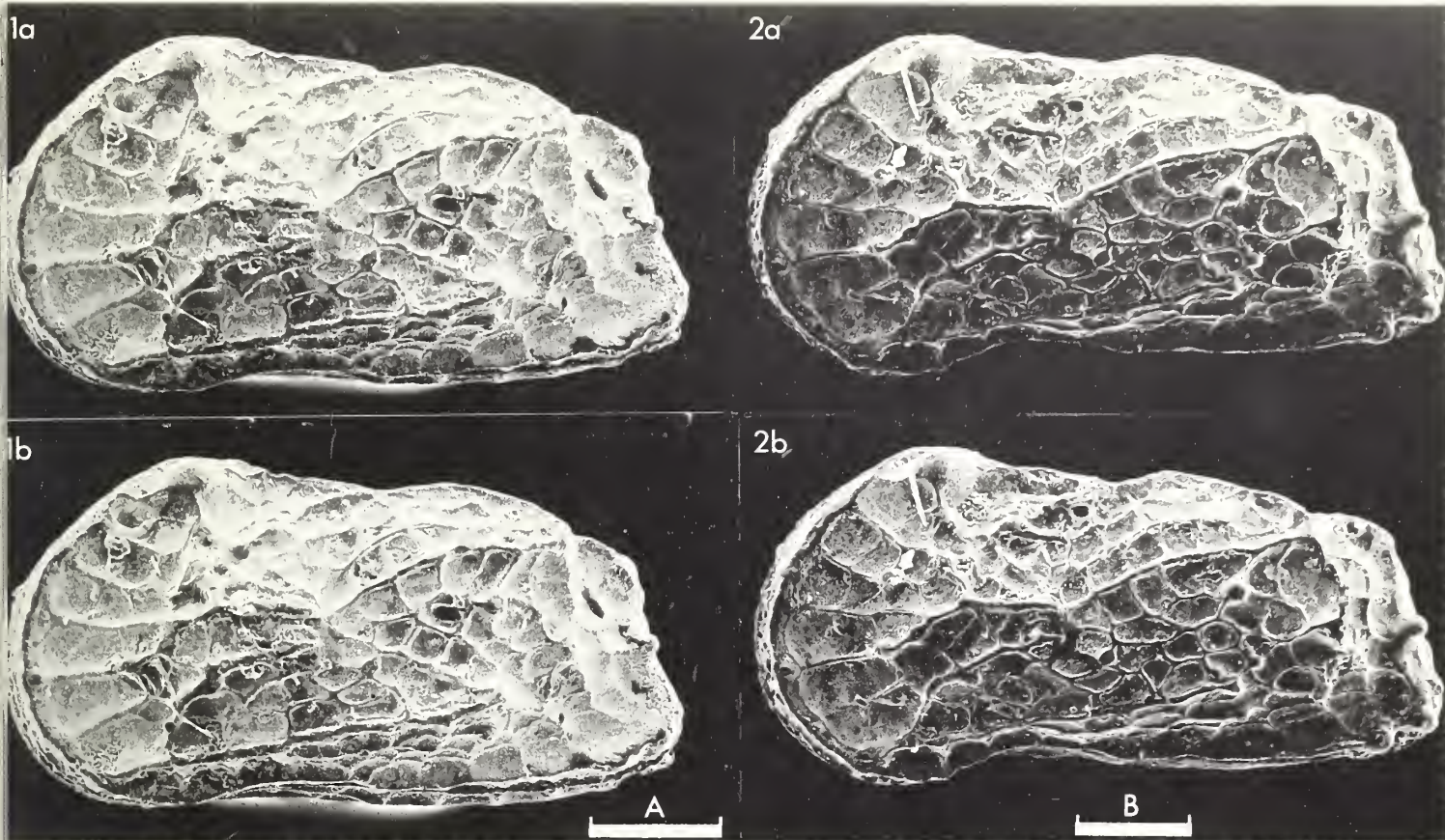
Hermanites transversicostata shows affinities with *Hermanites crucens* Siddiqui 1971 but, in the present species, the dorsal margin is humped and the ventral margin strongly concave just behind the anterior margin. Furthermore, the posterior margin has the steeply inclined, short posteriorly transverse ridge not seen in Siddiqui's species. *H. transversicostata* differs from *H. sp. cf. H. paijenborchianus* (Khosla 1978) in the shape of the posterior margin which is slightly concave posterodorsally and more rounded posteroventrally; the present species is also much longer.

Distribution: The species is found in the M Miocene of Tel. Hajer, Sheikh Ibrahim, Sheikhan, Bashiqa, Kirkuk and Hamerin sections.

It is very abundant and associated species are *A. dohukensis*, *A. iraqensis* and *Chrysocythere naqibi* (see Khalaf, *Stereo-Atlas of Ostracod Shells*, 9, 47-50, 51-54, 55-58, 1981).

Explanation of Plate 9, 62

Fig. 1, ♀ car., ext. dors. (paratype, **HU.275.T.16**, 824 μm long), fig. 2, ♂ car., ext. dors. (holotype, **HU.275.T.15**, 992 μm long). Scale A (200 μm; x 114), fig. 1; scale B (200 μm; x 86), fig. 2.



ON *PROPONTOCYPRIS TRIGONELLA* (SARS)

by John Athersuch and John E. Whittaker
(B.P. Research Centre, Sunbury and British Museum (Natural History), London)

Genus *Propontocypris* Sylvester-Bradley, 1947

Type species: (designated by Sylvester-Bradley, 1947) *Pontocypris trigonella* Sars, 1866

- 1866 *Pontocypris* gen. nov. G. O. Sars (*pars*), *Forh. Vidensk. Selsk. Krist.*, **1865**, 13.
1912 *Pontocypris* Sars; G. W. Müller, *Tierreich*, **31**, 109.
1923 *Pontocypris* Sars; G. O. Sars, *An Account of the Crustacea of Norway*, vol. 9, *Ostracoda*, Bergen Museum, parts 3, 4, 47.
1947 *Propontocypris* gen. nov. P. C. Sylvester-Bradley, *Ann. Mag. nat. Hist.*, ser. 11, **13**, 193.
1969 *Propontocypris* (*Propontocypris*) Sylvester-Bradley; R. F. Maddocks, *Smithson. Contrib. Zool.*, **7**, 11.
1969 *Propontocypris* (*Ekpontocypris*) subgen. nov. R. F. Maddocks, *ibid.*, 27.
1969 *Propontocypris* (*Schedopontocypris*) subgen. nov. R. F. Maddocks, *ibid.*, 37.

Diagnosis: Carapace trigonal, longest ventrally, moderately compressed; RV larger than LV; marginal flanges weak or absent; marginal serrations absent. Greatest height and inflation at, or slightly in front of midpoint. Adductor muscle-scars form cluster of five arranged in three near-horizontal rows or in a

Explanation of Plate 9, 64

Fig. 1, ♂ LV, ext. lat. (1982.25, 620 µm long); fig. 2, ♀ LV, ext. lat. (1982.26, 650 µm long); fig. 3, ♀ car., ext. dors. (1982.27, 650 µm long).
Scale A (200 µm; x 89), figs 1-3.

Diagnosis (contd.): rosette. First antenna 8-jointed; male legs symmetrical or nearly so. Terminal pectinate seta of third leg exceeded in length by one other seta. Subterminally, furca bears two stout setae of medium length flanked by two unequal, slender setae. Testes positioned posteriorly, curving forward ventrally. S-shaped ovaries positioned posteriorly. Large eyes present.

Remarks: Maddocks (1969) recognised three subgenera of *Propontocypris* based mainly on carapace curvature and details of the muscle-scar patterns. The appendages of all 3 subgenera would appear to be very similar, except for the fine structure of the genitalia.

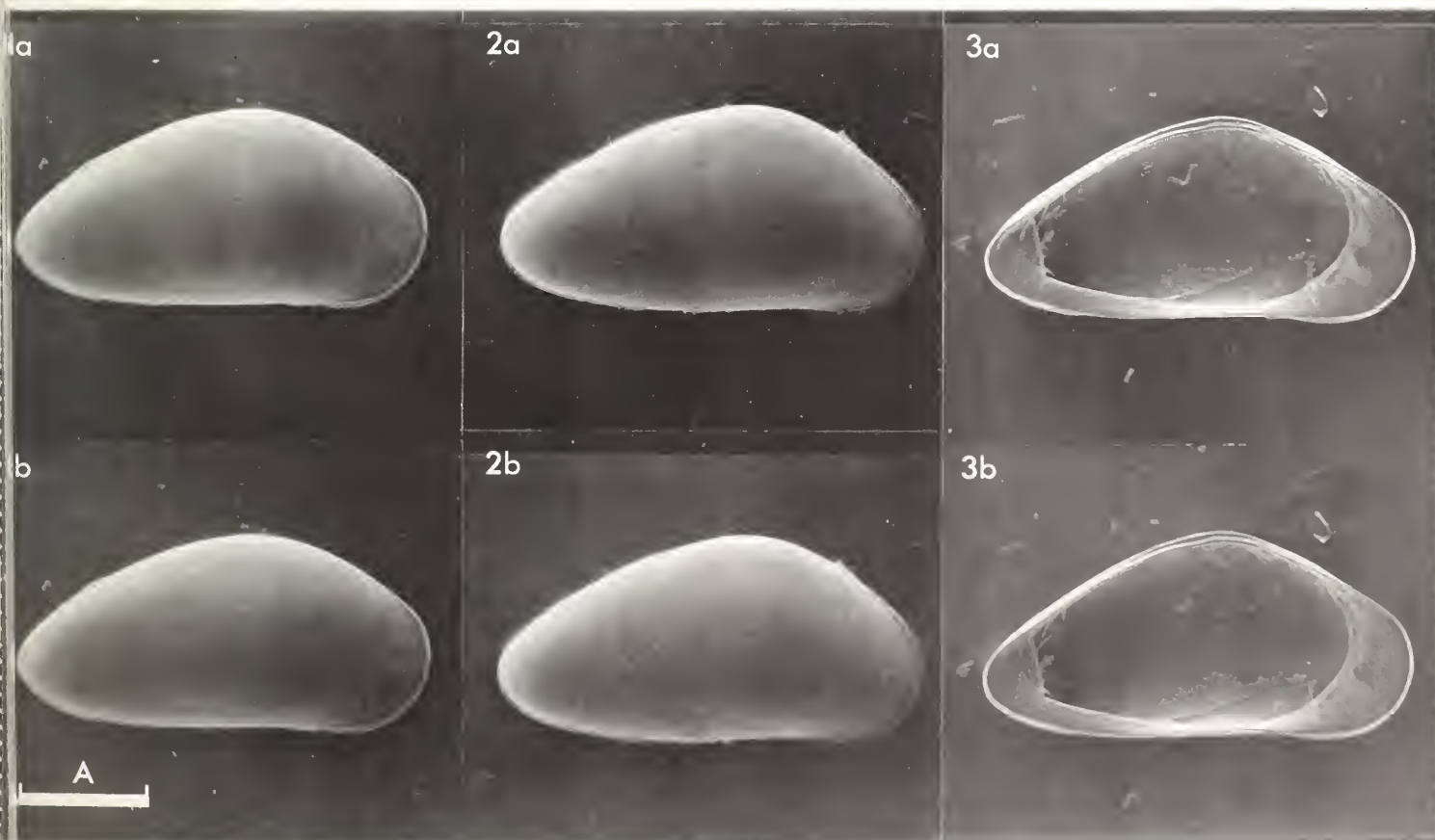
In our opinion the criteria used to separate these taxa are rather subjective and we prefer not to subdivide the genus.

Propontocypris may be distinguished from *Pontocypris* both on carapace and appendage characters. *Pontocypris* has five muscle-scars arranged in three horizontal rows, two in each of the lower rows, and one centrally above; the greatest inflation and height coincide well in front of the midpoint and the carapace is strongly elongated posteriorly; the dorsal margin is angular and the posteroventral margin of the RV is serrate. Maddocks (1969) records a number of striking differences between the soft parts of these two genera. *Pontocypris* is blind, has a 7-jointed first antenna and differs from *Propontocypris* in the detailed anatomy of the legs, the furcal setae and the genitalia.

The diagnosis of the appendages of *Propontocypris* is based on our own observations together with those recorded by Sars, 1923 and Maddocks, 1969.

Explanation of Plate 9, 66

Fig. 1, ♂ RV, ext. lat. (1982.28, 630 µm long); fig. 2, ♀ RV, ext. lat. (1982.29, 650 µm); fig. 3, ♀ LV, int. lat. (1982.30, 650 µm long).
Scale A (200 µm; x 89), figs. 1-3.



Propontocypris trigonella (Sars, 1866)

1866	<i>Propontocypris trigonella</i> sp. nov. (sic) G. O. Sars, <i>Førh. Vidensk. Selsk. Krist.</i> , 1865, 16 (lapsus calami).
1868	<i>Pontocypris trigonella</i> Sars; G. S. Brady, <i>Trans. Linn. Soc. Lond.</i> , 26, 387, pl. 25, figs. 31-34; pl. 38, fig. 3.
1923	<i>Pontocypris trigonella</i> Sars; G. O. Sars, <i>An Account of the Crustacea of Norway</i> , vol. 9, <i>Ostracoda</i> , Bergen Museum, 48, pl. 20.
1947	<i>Propontocypris trigonella</i> (Sars); P. C. Sylvester-Bradley, <i>Ann. Mag. Nat. Hist.</i> , ser. 11, 13, 193 (new combination).
1957	<i>Pontocypris trigonella</i> Sars; A. P. C. de Vos, <i>Arch. Zool. exp. appl.</i> , 95, 10, pl. 4, figs. 1a-l.

Type specimens: Several dried and unrecognisable specimens remain in the Sars Collection, Zoological Museum, Oslo, Norway; no. F 1532. However, Sars' (1923) illustrations and description adequately define this species.

Type locality: Risør, Norway; approx. lat. 58° 44' N, 09° 15' E. Recent.

Diagnosis: Carapace of medium size (c. 0.60-0.70 mm), dimorphic. Greatest height slightly anterior to mid-point, with broadly rounded dorsal margin; more tapered posteriorly; rounded at both ends. In dorsal view, carapace moderately inflated, widest in front of midpoint, rounded posteriorly, acutely tapering anteriorly. Slight marginal flange anteriorly, and to a lesser extent, posteriorly, in both valves. Male carapace proportionately more elongate than female. Furcae and male copulatory appendages distinctive.

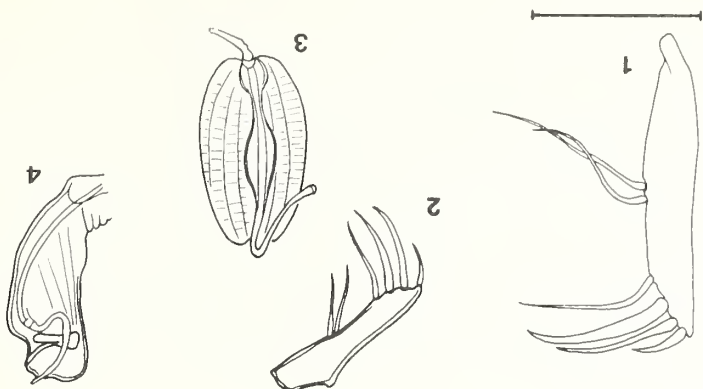
Figured specimens: Brit. Mus. (Nat. Hist.) nos. 1982.25 (♂ LV: Pl. 9, 64, fig. 1), 1982.26 (♀ LV: Pl. 9, 64, fig. 2), 1982.27 (♀ LV: Pl. 9, 66, fig. 3), 1982.28 (♂ RV: Pl. 9, 66, fig. 1), 1982.29 (♀ RV: Pl. 9, 66, fig. 2), 1982.30 (♀ LV: Pl. 9, 66, fig. 3), 1982.31 (♂ appendages: Text-fig. 1), 1982.25, 26, 28-30, ex Norman Collection no. 1911.11.8.M3019 from "oyster ooze" at Stranraer, SW Scotland (lat. 54° 55' N, long. 05° 00' W); 1982.27 ex Scott Collection from Loch Fyne, W Scotland, collected 1896; lat. 56° 00' N, long. 05° 25' W, 1982.31, ex Norman Collection, no. 1900.3.6.150, from Firth of Clyde, W Scotland, collected July 1885.

Stereo-Atlas of Ostracod Shells 9, 68

Propontocypris trigonella (6 of 6)

Remarks: For a comparison with *Propontocypris piriifera* (G. W. Müller) with which *P. trigonella* has frequently been confused, see Athtersuch & Whitaker, (*Stereo-Atlas of Ostracod Shells*, 9, 69-76, 1982). No males could be found from our British collections which were well enough preserved to allow dissection of the male copulatory appendages, although one specimen still had a furca intact (Text-fig. 1). Text-fig. 4 is therefore redrawn after Sars (1923, pl. 20) for comparison of the copulatory appendages with those of *P. piriifera* (see Athtersuch & Whitaker, *op. cit.*, text-figs. 2, 4, 6); a further drawing, again after Sars (1923), is finally appended (Text-fig. 2) in order to compare the furca of the Norwegian specimen with that from Britain.

Distribution: A NW European species; records from Scandinavian and British coasts can be confirmed; Mediterranean records need to be checked. Found in small numbers on a variety of substrates in sub-littoral, marine environments.



Text-figs. 1-4. Appendages of *P. trigonella*, ♂♂. Fig. 1, Furca (1982.31). Firth of Clyde, Scotland; figs. 2-4, Furca, Zenker's organ and copulatory appendage, Norway (after Sars, 1923, pl. 20). Scale 100 μm; fig. 1, Figs. 2-4, no scale.

Propontocypris trigonella (Sars, 1866)

- 1866 *Potocypris trigonella* sp. nov. (sic) G. O. Sars, *Forh. Vidensk. Selsk. Krist.*, **1865**, 16 (*lapsus calami*).
 1868 *Pontocypris trigonella* Sars; G. S. Brady, *Trans. Linn. Soc. Lond.*, **26**, 387, pl. 25, figs. 31-34; pl. 38, fig. 3.
 1923 *Pontocypris trigonella* Sars; G. O. Sars, *An Account of the Crustacea of Norway*, vol. 9, *Ostracoda*, Bergen Museum, 48, pl. 20.
 1947 *Propontocypris trigonella* (Sars); P. C. Sylvester-Bradley, *Ann. Mag. nat. Hist.*, ser. 11, **13**, 193 (new combination).
 1957 *Pontocypris trigonella* Sars; A. P. C. de Vos, *Arch. Zool. exp. gén.*, **95**, 10, pl. 4, figs. 1a-i.

Type specimens: Several dried and unrecognisable specimens remain in the Sars Collection, Zoological Museum, Oslo, Norway, no. F 1532. However, Sars' (1923) illustrations and description adequately define this species.

Type locality: Risør, Norway, approx. lat. 58° 44' N, 09° 15' E. Recent.

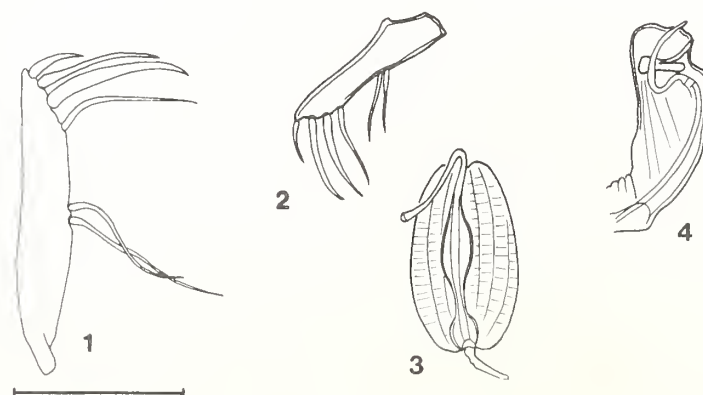
Diagnosis: Carapace of medium size (c. 0.60-0.70 mm), dimorphic. Greatest height slightly anterior to midpoint, with broadly rounded dorsal margin; more tapered posteriorly; rounded at both ends. In dorsal view, carapace moderately inflated, widest in front of midpoint, rounded posteriorly, acutely tapering anteriorly. Slight marginal flange anteriorly, and to a lesser extent, posteriorly, in both valves. Male carapace proportionately more elongate than female. Furcae and male copulatory appendages distinctive.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **1982.25** (♂ LV: Pl. 9, 64, fig. 1), **1982.26** (♀ LV: Pl. 9, 64, fig. 2), **1982.27** (♀ car.: Pl. 9, 64, fig. 3), **1982.28** (♂ RV: Pl. 9, 66, fig. 1), **1982.29** (♀ RV: Pl. 9, 66, fig. 2), **1982.30** (♀ LV: Pl. 9, 66, fig. 3), **1982.31** (♂ appendages: Text-fig. 1). **1982.25, 26, 28-30**, ex Norman Collection no. **1911.11.8.M3019** from "oyster ooze" at Stranraer, SW Scotland (lat. 54° 55' N, long. 05° 00' W); **1982.27** ex Scott Collection from Loch Fyne, W Scotland, collected 1896; lat. 56° 00' N, long. 05° 25' W. **1982.31**, ex Norman Collection, no. **1900.3.6.150**, from Firth of Clyde, W Scotland, collected July 1885.

Remarks: For a comparison with *Propontocypris pirifera* (G. W. Müller) with which *P. trigonella* has frequently been confused, see Athersuch & Whittaker, (*Stereo-Atlas of Ostracod Shells*, **9**, 69-76, 1982).

No males could be found from our British collections which were well enough preserved to allow dissection of the male copulatory appendages, although one specimen still had a furca intact (Text-fig. 1). Text-fig. 4 is therefore redrawn after Sars (1923, pl. 20) for comparison of the copulatory appendages with those of *P. pirifera* (see Athersuch & Whittaker, *op. cit.*, text-figs. 2, 4, 6); a further drawing, again after Sars (1923), is finally appended (Text-fig. 2) in order to compare the furca of the Norwegian specimen with that from Britain.

Distribution: A NW European species; records from Scandinavian and British coasts can be confirmed; Mediterranean records need to be checked. Found in small numbers on a variety of substrates in sub-littoral, marine environments.



Text-figs. 1-4, Appendages of *P. trigonella*, ♂♂. Fig. 1, Furca (**1982.31**). Firth of Clyde, Scotland; figs. 2-4, Furca, Zenker's organ and copulatory appendage, Norway (after Sars, 1923, pl. 20). Scale 100 μm; fig. 1. Figs. 2-4, no scale.

ON *PROPONTOCYPRIS PIRIFERA* (G. W. MÜLLER)

by John Athersuch and John E. Whittaker
(B.P. Research Centre, Sunbury and British Museum (Natural History), London)

Propontocypris pirifera (G. W. Müller, 1894)

- 1889 *Pontocypris trigonella* Sars; G. S. Brady & A. M. Norman (*pars*), *Scient. Trans. R. Dubl. Soc.*, **4**, 109, pl. 22, figs. 18-25; pl. 23, fig. 6 (*non P. trigonella* Sars. 1866).
 1894 *Pontocypris pirifera* sp. nov. G. W. Müller, *Fauna Flora Golf. Neapel*, **21**, 247, pl. 10, figs. 1-3, 18-20, 22-24; pl. 38, fig. 52.
 1957 *Pontocypris pirifera* Müller; A. P. C. de Vos, *Arch. Zool. exp. gén.*, **95**, 12, pl. 5, figs. 1a-1.
 1969 *Propontocypris pirifera* (Müller); I. Yassini, *Bull. Inst. Geol. Bassin Aquitaine*, **7**, 29, pl. 15.
 1969 *Propontocypris* (*Ekpontocypris*) *pirifera* (Müller); R. F. Maddocks, *Smithson. Contrib. Zool.*, **7**, 27 (no description).
 1976 *Propontocypris pirifera* (Müller); G. Bonaduce, G. Ciampo & M. Masoli, *Pubbl. Staz. zool. Napoli*, **40**, pl. 9, figs. 5, 6 (no description).

Type specimens: Several specimens remain in the Müller Collection at the Zoologischen Institut, Greifswald and at the Institut für Spezielle Zoologie und Zoologisches Museum der Humboldt Universität zu Berlin, E Germany.

Type locality: Bay of Naples, W Italy, approx. lat. 40° 50' N, long. 14° 15' E. Recent.

Explanation of Plate 9, 70

Fig. 1, ♂ car., ext. rt. lat. (1982.11, 970 μm long); fig. 2, ♀ car., ext. rt. lat. (1982.12, 830 μm long); fig. 3, ♀ car., ext. lt. lat. (1982.13, 790 μm long).

Scale A (250 μm; x 65), figs. 1-3.

Diagnosis: Carapace large, strongly dimorphic. Greatest height at midpoint; marked by distinct cardinal angle, particularly in RV. Anterior margin broadly rounded, posterior slightly more tapered. In dorsal view, carapace moderately and evenly inflated, widest at midpoint, rounded at both ends. Marginal rim anteriorly in RV. Males more trigonal than females. Furcae and male copulatory appendages distinctive.

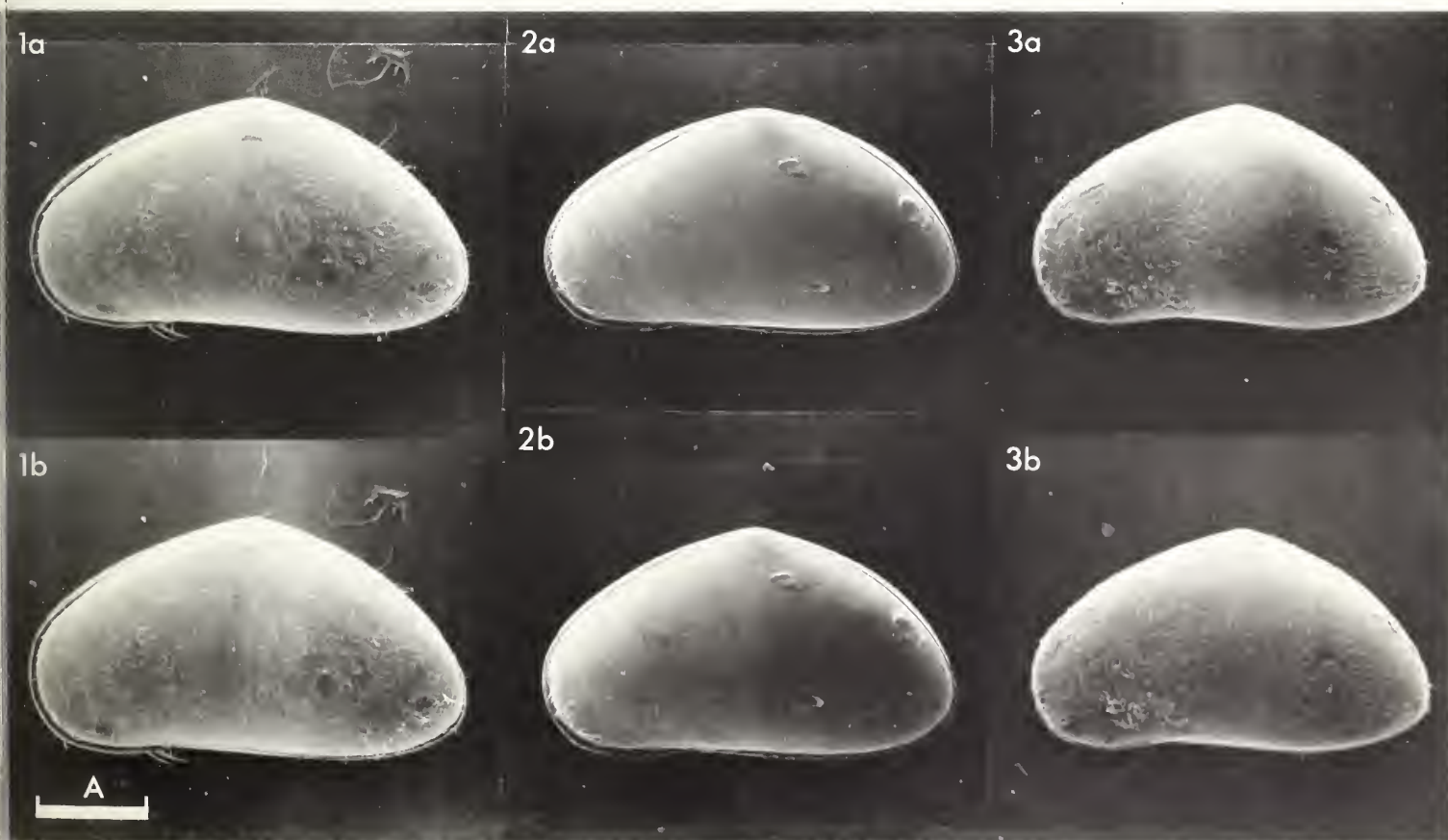
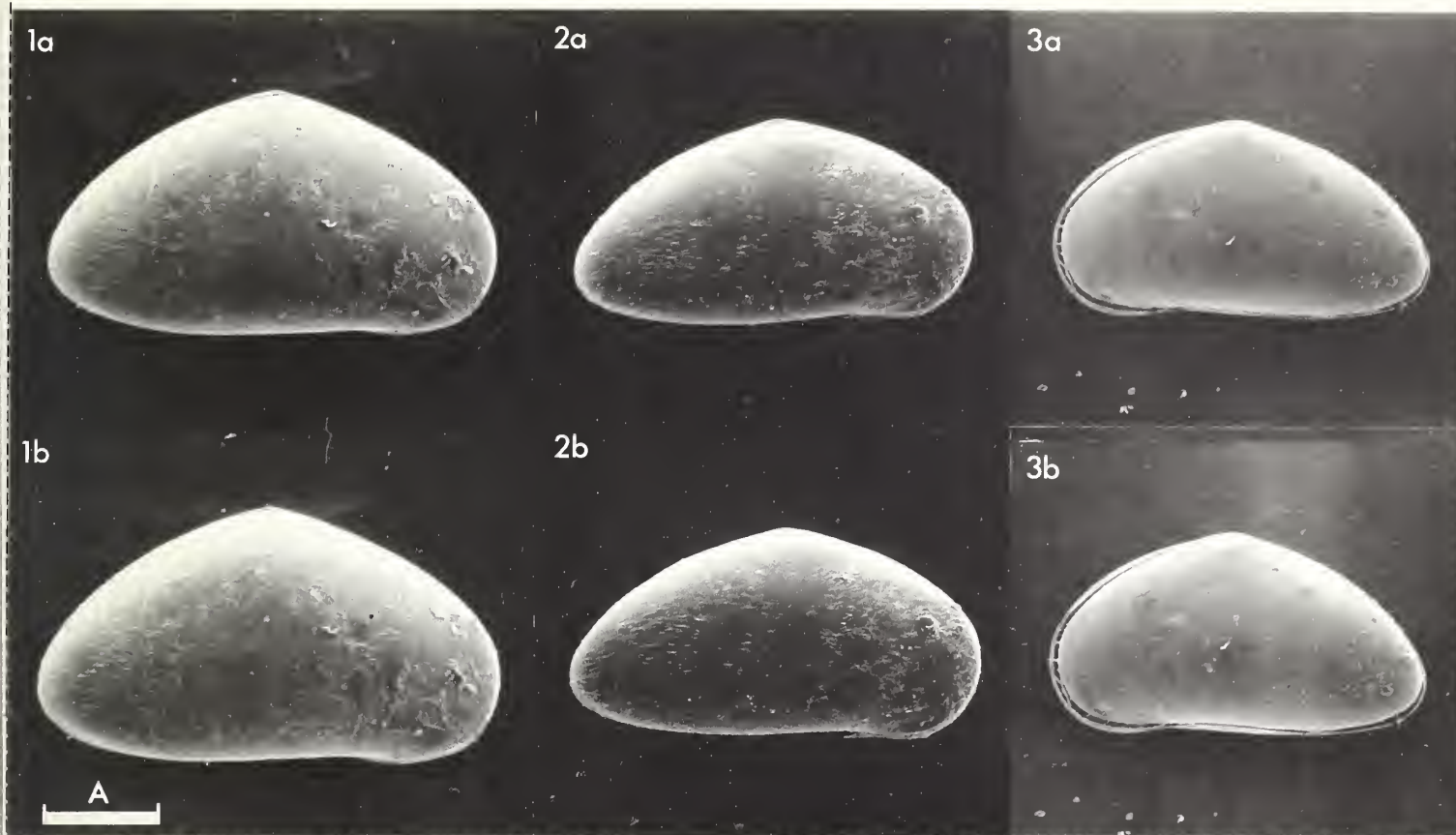
Figured specimens: Brit. Mus. (Nat. Hist.) nos. 1982.11 (♂ car.: Pl. 9, 70, fig. 1; Pl. 9, 74, fig. 3), 1982.12 (♀ car.: Pl. 9, 70, fig. 2), 1982.13 (♀ car.: Pl. 9, 70, fig. 3), 1982.14 (♂ car.: Pl. 9, 72, fig. 1), 1982.15 (♀ car.: Pl. 9, 72, fig. 2), 1982.16 (♂ LV: Pl. 9, 72, fig. 3), 1982.17 (A-1 car.: Pl. 9, 74, fig. 1), 1982.18 (♀ car.: Pl. 9, 74, fig. 2), 1982.19 (♂ RV and appendages: Pl. 9, 76, fig. 1), 1982.20 (♀ RV: Pl. 9, 76, fig. 2), 1982.21 (♂ RV: Pl. 9, 76, fig. 3), 1982.22 (♂ appendages: Text-figs. 1, 2), 1982.23 (♂ appendages: Text-figs. 3, 4), 1982.24 (♂ appendages: Text-figs. 5, 6).

1982.11-14, 17-19, 21, 22, were collected alive by J. E. Whittaker from various stations in East Fleet, Dorset, S England (lat. 50° 36' N, long. 02° 28' W), between August 1968 and August 1969, on *Zostera*, green-algae and *Laminaria* holdfasts; salinities varied between 31 and 35‰, and water temperature 7 to 21°C, depth 0.5-3 m. 1982.16, 20, 23, are from Cyprus and were collected alive by J. Athersuch, in November 1973. 1982.16, 23, are from S of Cape Greco (lat. 33° 55' N, long. 34° 10' E), water temperature 21.5°C, depth 8 m on algae; 1982.20 is from Faimagusta Bay (lat. 35° 07' N, long. 33° 56' E), water temperature 22°C, depth 15 m, in fine sand. Salinity in both localities c. 39‰. 1982.15, 24 (ex slide no. 1972.3.2.2) collected by K. G. McKenzie from Lago del Fusaro, near Naples, W Italy; approx. lat. 41° 40' N, long. 14° 04' E.

Explanation of Plate 9, 72

Fig. 1, ♂ car., ext. lt. lat. (1982.14, 940 μm long); fig. 2, ♂ car., ext. lt. lat. (1982.15, 860 μm long); fig. 3, ♂ car., ext. lt. lat. (1982.16, 830 μm long).

Scale A (250 μm; x 65), figs. 1-3.



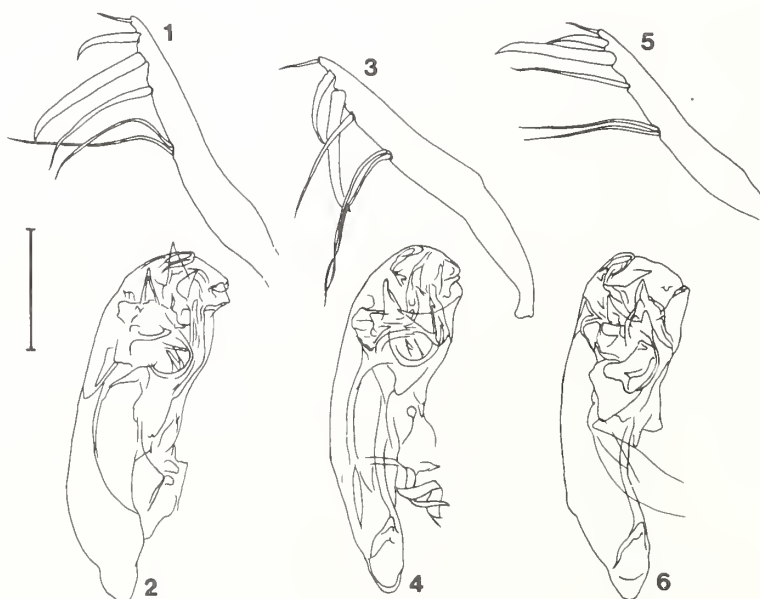
Remarks: *P. pirifera* differs in size and shape from *P. trigonella* (Sars) with which it has often been confused. *P. trigonella* is smaller and more elongate, particularly posteriorly, than *P. pirifera*. Furthermore, the greatest height and inflation is further forward in *P. trigonella*. The furcae and copulatory appendages of each species are also very distinctive (cf. Text-figs. 1-6, herein and *StereAtlas of Ostracod Shells*, 9, 63-68, text-figs. 1, 2, 4). Both species are sexually dimorphic but in *P. pirifera* this is very pronounced; the male is the larger of the two sexes in *P. pirifera*, but the smaller dimorph in *P. trigonella*. The male carapaces from the population in The Fleet are considerably larger (c. 0.95 mm) than those from the Mediterranean (c. 0.85 mm), whilst their copulatory appendages are virtually identical in size. The pear-shaped sperm heads (after which the species is named) are well seen in Pl. 9, 76, fig. 1.

Distribution: Associated with algae and sea-grass in brackish and marine littoral and shallow sublittoral environments. Some records from Scotland, S England, the Atlantic coast of France and the Mediterranean, as far E as Cyprus, can be confirmed. Many specimens from British coasts, examined by the authors in the Brit. Mus. (Nat. Hist.) and Hancock Museum, Newcastle-upon-Tyne, purporting to be *P. trigonella*, are referable to *P. pirifera*. Our investigations show that *P. pirifera* has a wider geographical distribution outside the Mediterranean than previously recognised.

Explanation of Plate 9, 74

Fig. 1, A-I car., ext. lt. lat. (1982.17, 750 μ m long); fig. 2, ♀ car., ext. dors. (1982.18, 850 μ m long); fig. 3, ♂ car., ext. rt. lat. showing normal pores and setae (1982.11).

Scale A (250 μ m; x 65), figs. 1, 2; scale B (10 μ m; x 1,650), fig. 3.

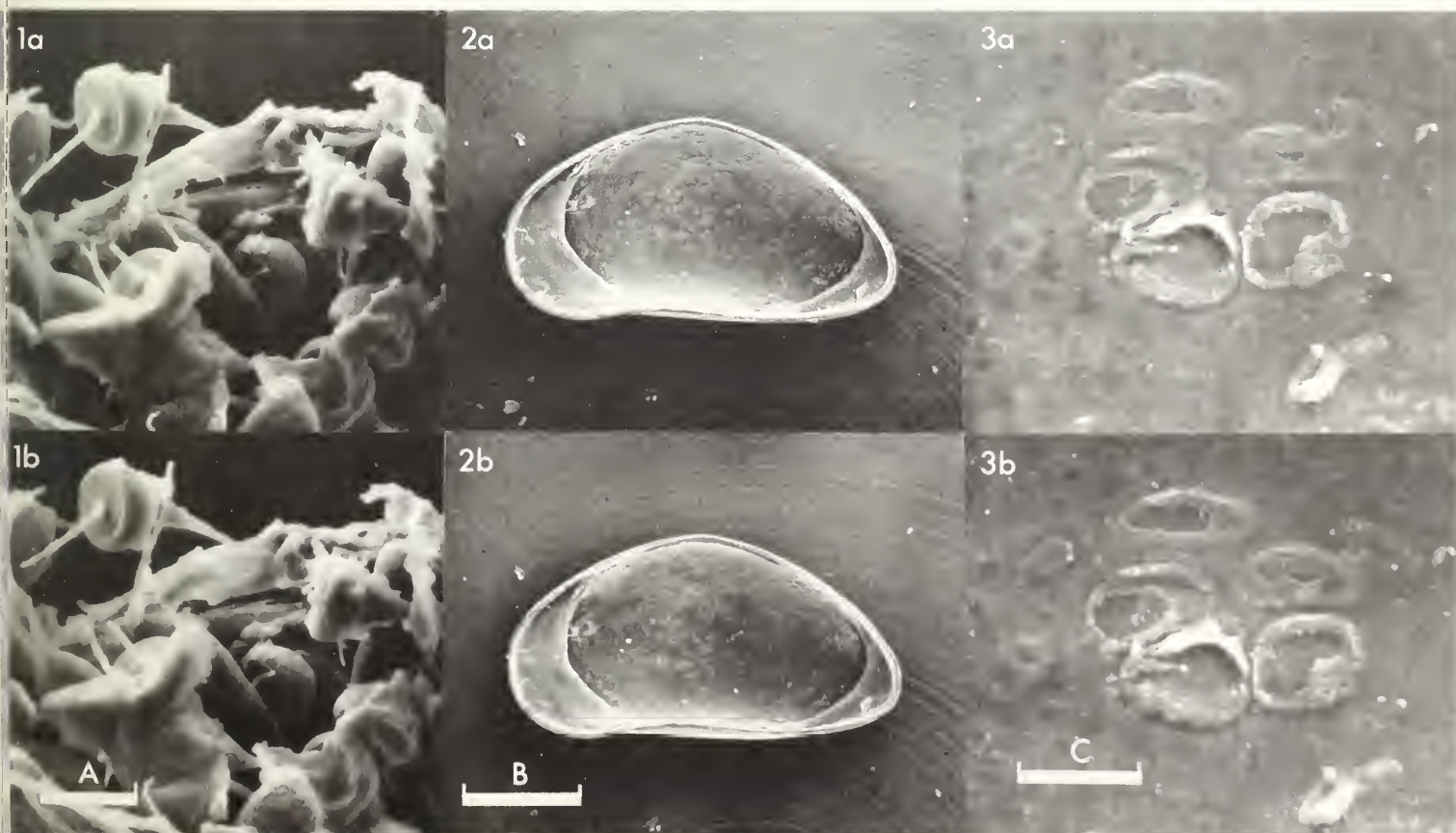
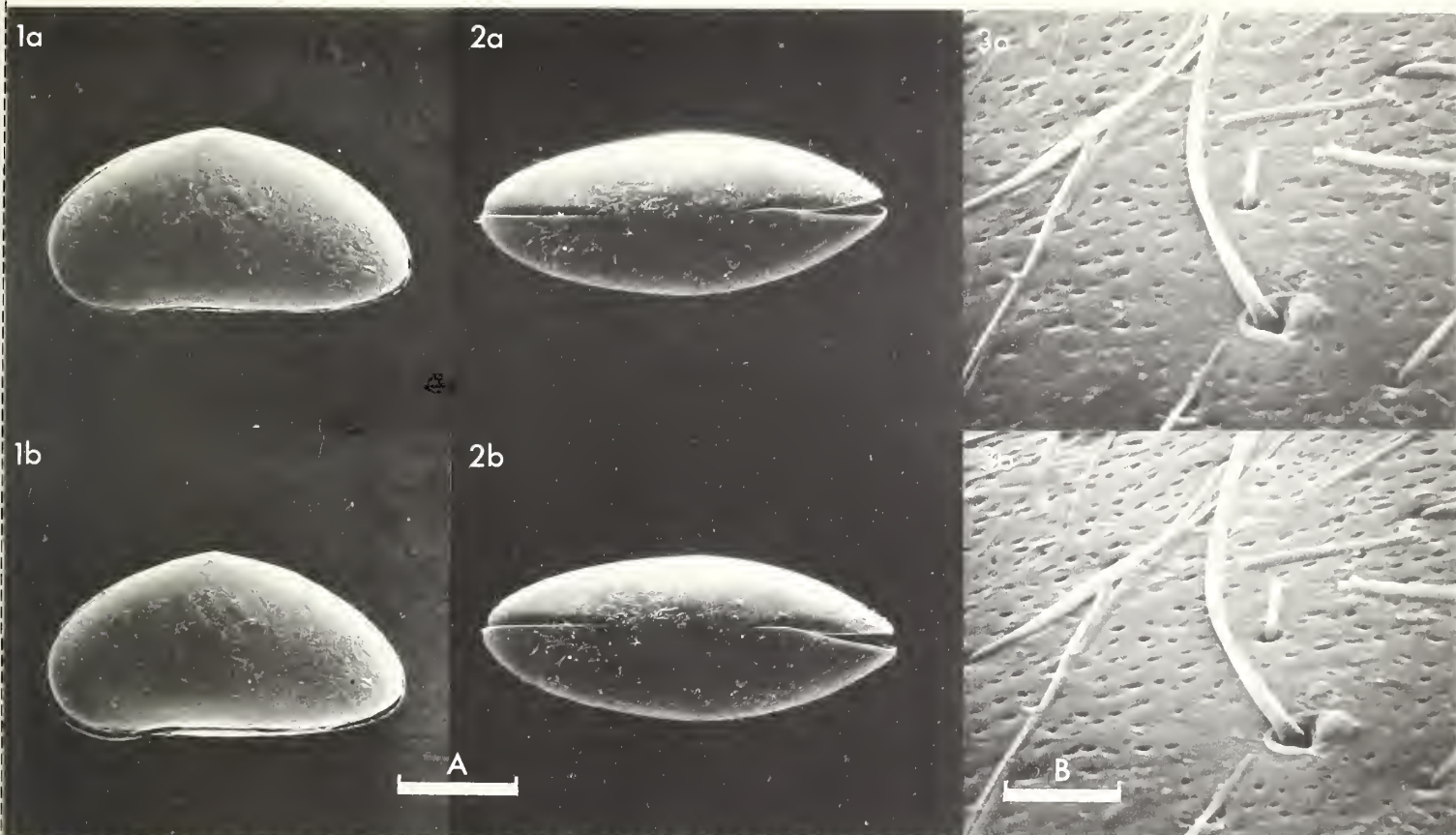


Text-figs. 1-6, Appendages of *P. pirifera*, ♂♂. Figs. 1, 2, Furca and copulatory appendage (1982.22), The Fleet, S England; figs. 3, 4, ditto (1982.23), Cyprus; figs. 5, 6, ditto (1982.24), Naples. Scale 100 μ m; x 200. After drawings by D. J. Horne.

Explanation of Plate 9, 76

Fig. 1, ♂, detail of sperm (1982.19); fig. 2, ♀ RV, int. lat. (1982.20, 770 μ m long); fig. 3, ♂ RV, int. lat., musc. sc. (1982.21).

Scale A (25 μ m; x 520), fig. 1; scale B (250 μ m; x 65), fig. 2; scale C (50 μ m; x 330), fig. 3.



ON *BONNYANNELLA ROBERTSONI* (BRADY)

by John Athersuch
(B.P. Research Centre, Sunbury-on-Thames, England)

Genus *BONNYANNELLA* gen nov.

Type species: *Cythere robertsoni* Brady, 1868

Derivation of name: After my wife, Dr Anne Bonny, in appreciation of her encouragement of my ostracod studies.

Diagnosis: Genus of the Loxoconchidae with small (400-500 μm long) reticulate carapace; elongate and quadrate in lateral view; in dorsal view evenly inflated, broadly rounded anteriorly, obtusely tapered posteriorly. Large smooth eye spots. Conjunctive, rimmed normal pores. Hinge gongylodont, median element smooth, posterior tooth of right valve curved around socket. Adductor muscle scars decrease in size from top to bottom; upper three scars elongate, lower scar rounded. Frontal scar U-shaped. Fulcral notch present. Antennula and antenna stout with long strong setae; antennula six-jointed. Respiratory plate of maxillula bears a single reflexed seta. Male copulatory appendage subovate with an inconspicuous rounded terminal lappet; *ductus ejaculatorius* conspicuous and simply coiled.

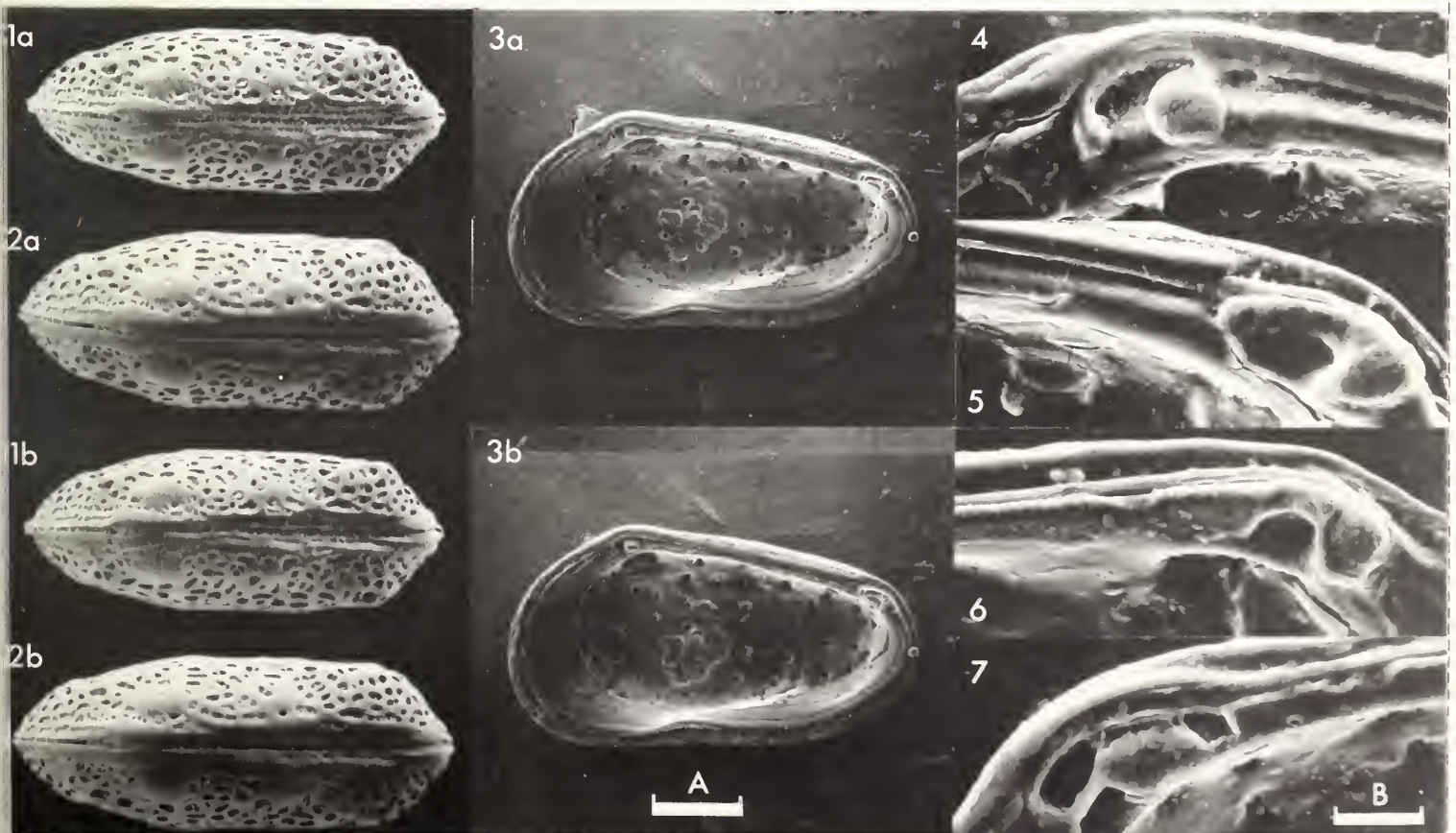
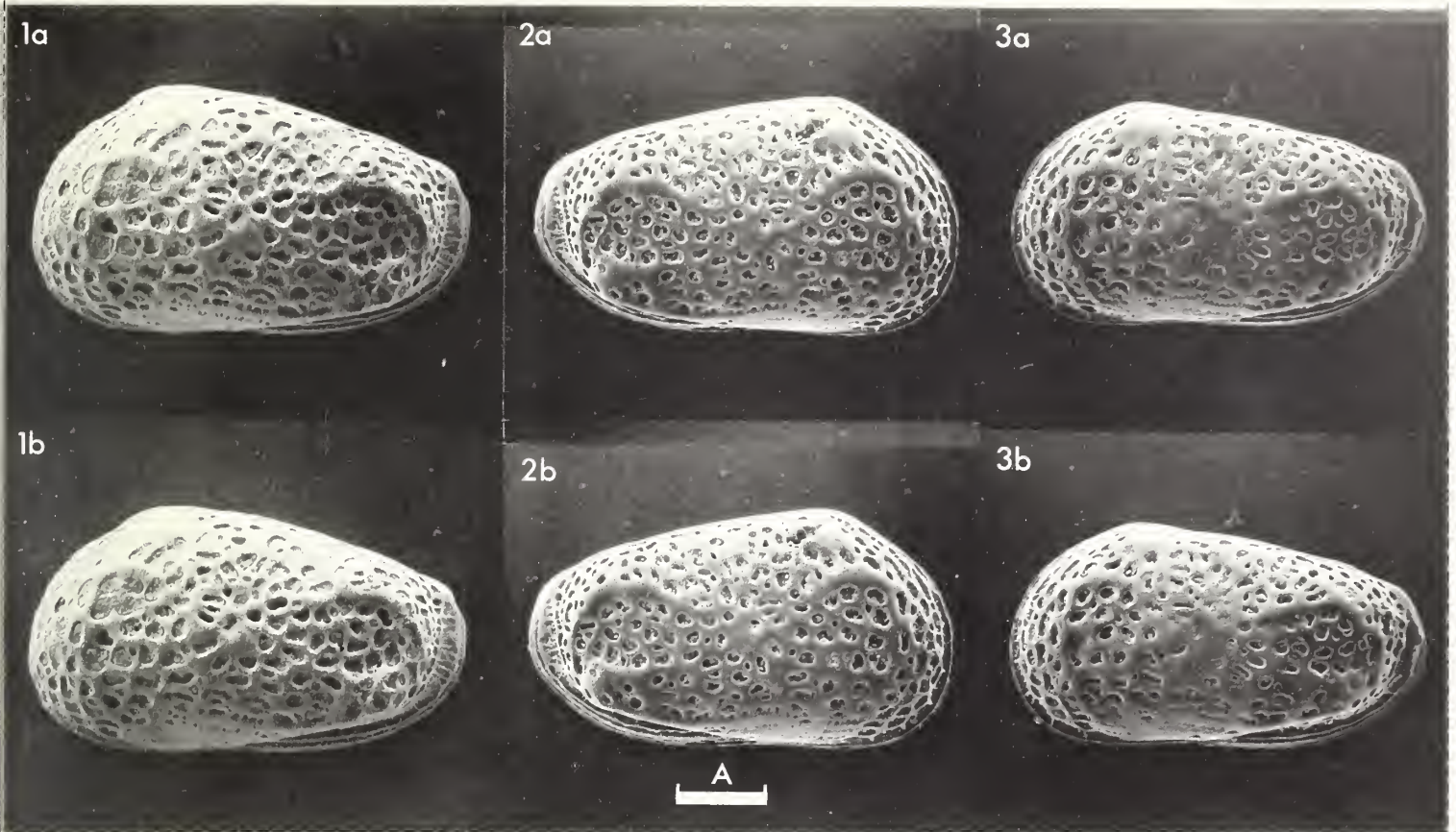
Explanation of Plate 9, 78

Fig. 1, ♀ LV, ext. lat. (lectotype, Hancock Museum specimen A, 480 μm long); fig. 2, ♀ car., ext. rt. lat. (1982.1, 460 μm long); fig. 3, ♂ LV, ext. lat. (1982.2, 450 μm long).
Scale A (100 μm ; x 127), figs. 1-3.

Remarks: *Bonnyannella* differs from *Loxoconcha* in having antennulae with six, instead of five, podomeres and in possessing a fulcral notch and a smooth median hinge element. It may be distinguished from *Cytheromorpha* by its smaller size, by weaker sexual dimorphism, by less pronounced subdivision of the posterior tooth/socket and by a less prominent fulcral notch. The two genera differ in the general form of the copulatory appendages and, as far as I am able to determine, *Cytheromorpha* lacks an aberrant reflexed seta on the respiratory plate of the maxillula. The type species of *Bonnyannella*, *B. robertsoni*, closely resembles *Sagmatocythere*, typified by *S. napoliana* (Puri) in the general structure of the hinge, except that in *Bonnyannella* the terminal elements are less curved and are not as distinctly lobed as in *Sagmatocythere*. However, the two genera differ in a number of other important respects. Unlike *Sagmatocythere*, *Bonnyannella* does not have sub-parallel dorsal and ventral margins, a conspicuous marginal flange or pore conuli. In addition, the reticulum of *Bonnyannella* is far less pronounced with a tendency towards celation of the fossae. In contrast to *Sagmatocythere*, neither sex is highly inflated and the male does not have a post-ocular depression. The four distal podomeres of the antennulae in *Bonnyannella* are noticeably stouter and bear relatively much longer and more conspicuous setae than those of *Sagmatocythere*. Furthermore, the distal seta of the second podomere of the third leg is longer than the third podomere, whereas in *Sagmatocythere* it is shorter. The length of this seta has been used in the diagnosis of another loxoconchid genus, *Lindisfarnia* (Horne & Kilenyi, *Stereo-Atlas of Ostracod Shells*, 8, 107, 1981), and may prove to be of some taxonomic significance. The other appendages of *Bonnyannella* and *Sagmatocythere* are similar.

Explanation of Plate 9, 80

Fig. 1, ♂ car., ext. dors. (Hancock Museum specimen B, 450 μm long); fig. 2, ♀ car., ext. dors. (Hancock Museum specimen C, 470 μm long); fig. 3, ♂ RV, int. lat. (1982.3, 450 μm long); figs. 4, 5, ♂ RV, int. lat. terminal hinge elements (1982.4, 440 μm long); figs. 6, 7, ♂ LV, int. lat., terminal hinge elements (1982.4).
Scale A (100 μm ; x 127), figs. 1-3; scale B (25 μm ; x 470), figs. 4-7.



Bonnyannella robertsoni (Brady, 1868)

- 1868 *Cythere Robertsoni* sp. nov. G. S. Brady, *Ann. Mag. nat. Hist.*, ser. 4, 2, 33, pl. 4, figs. 5, 8-10.
 1969 *Cytheromorpha robertsoni* (Brady); I. Yassini, *Bull. Inst. Geol. Bassin Aquitaine*, 7, 111, pl. 18, fig. 3; pl. 19, fig. 20.

Lectotype: In the Brady Collection, Hancock Museum, Newcastle-upon-Tyne, ♀ LV. No registration number, but housed in a separate, labelled slide.

Type locality: Dröbak, Oslofjord, S Norway (lat. 59° 40' N, long. 10° 40' E); from 30-35 fathoms (55-65 m); Recent.

Diagnosis: Carapace with numerous small, sub-rounded, deep fossae; evenly inflated with slight posterior protuberances dorsally and ventrally; parallel-sided in dorsal view.

Figured specimens: Hancock Museum specimens (no catalogue numbers, but placed in separate labelled slides) **A** (lectotype, ♀ LV: Pl. 9, 78, fig. 1), **B** (♂ car.: Pl. 9, 80, fig. 1), **C** (♀ car.: Pl. 9, 80, fig. 2).

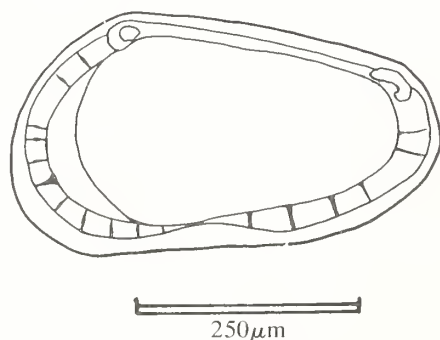
Brit. Mus. (Nat. Hist.) specimen nos. **1982.1** (♀ car.: Pl. 9, 78, fig. 2), **1982.2** (♂ car.: Pl. 9, 78, fig. 3), **1982.3** (♂ RV: Pl. 9, 80, fig. 3; Text-fig. 2), **1982.4** (♂ LV & RV: Pl. 9, 80, figs. 4-7), **1982.5** (♀ car. and appendages: Text-figs. 3a-d, 4b-d), **1982.6** (♂ car. and appendages: Text-fig. 4a), **1982.127** (♀ RV: Text-fig. 1).

Hancock Museum specimens **A**, from Dröbak, S Norway, **B** and **C** from 4 miles off Hawthorn, Yorkshire, NE England (ex Brady slide N₃), depth 20 fathoms (36 m).

Brit. Mus. (Nat. Hist.) specimens **1982.1** and **1982.2** were collected by T. Scott from the Firth of Clyde, SW Scotland. **1982.3**, from beach sand at Cemaes Bay, Anglesey, N Wales (lat. 53° 25' N, long. 04° 30' W), was collected by C. P. Palmer. **1982.4**, **6** and **127** were found by the author in beach sand: **1982.4** and **127** at Robin Hood's Bay, Yorkshire, NE England (lat. 54° 25' N, long. 00° 35' W) and **1982.6** from Colwyn Bay, N Wales (lat. 53° 17' N, long. 03° 44' W). **1982.5**, collected by D. J. Horne, was living amongst *Laminaria* holdfasts at low-water mark, Gore Point, Porlock, SW England (lat. 51° 14' N, long. 03° 37' W).

Remarks: *Cytheromorpha exigua* Wouters, 1978 (*Een Systematische, Biostratigrafische en Paleobiologische studie van de Ostracoda uit Miocene afzettingen in Noord-Belgie*, Leuven, 2, 25, pl. 4, figs. 1a, 1b; pl. 34, figs. 7a, 7b), from the Egedem and Antwerp Sands (Miocene) of Belgium may be referred to *Bonnyannella*. It differs from *B. robertsoni* in dorsal view in being more inflated and rounded posteriorly. It also lacks any posterodorsal protuberance. I am unaware of any other species that may be assigned to *Bonnyannella*.

Distribution: Recorded from the lower littoral and sublittoral zones of the coasts of Britain, mainly in the south, to a depth of about 70 m. Known also from the Atlantic coasts of France, Germany, S Norway and the Baltic.



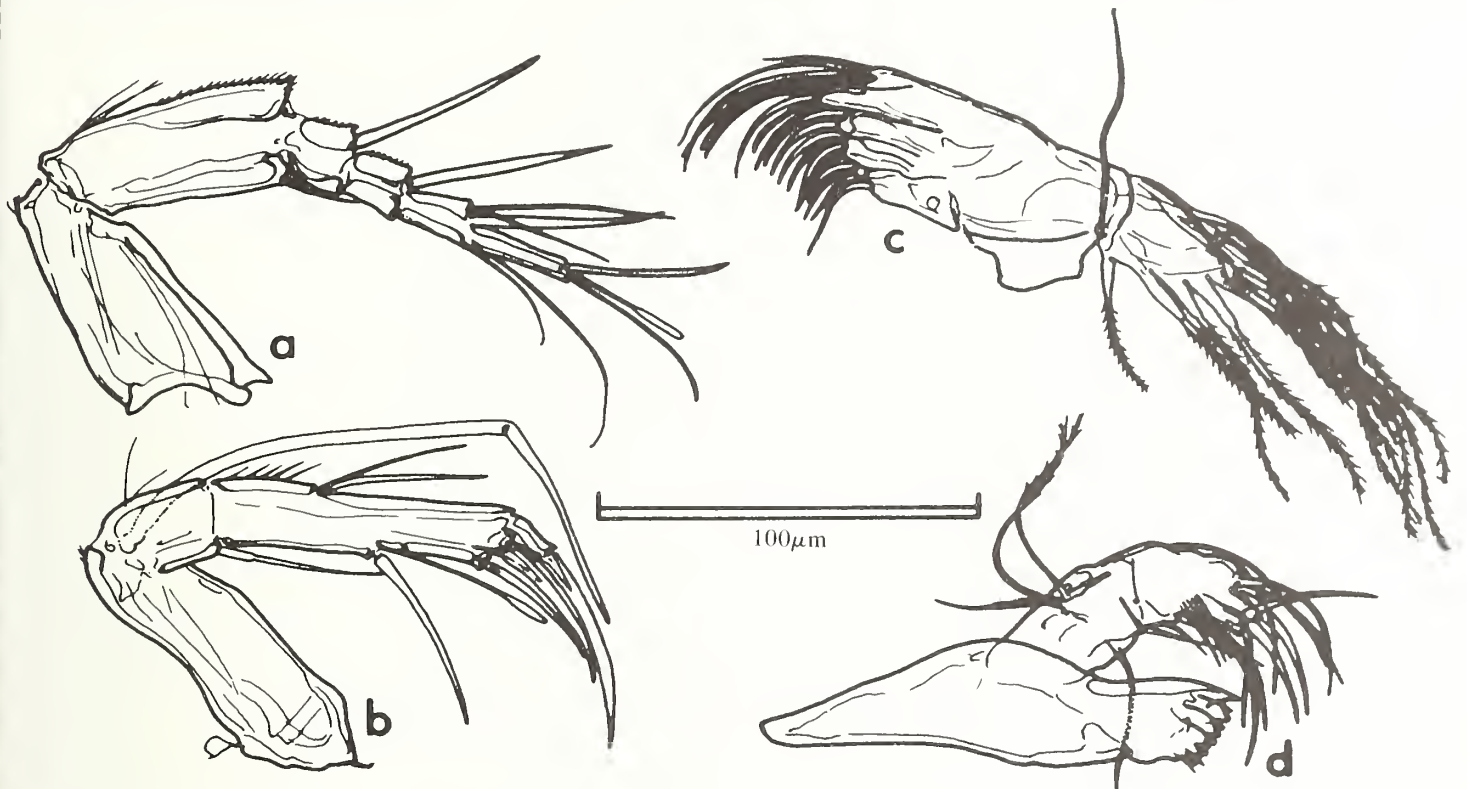
Text-fig. 1



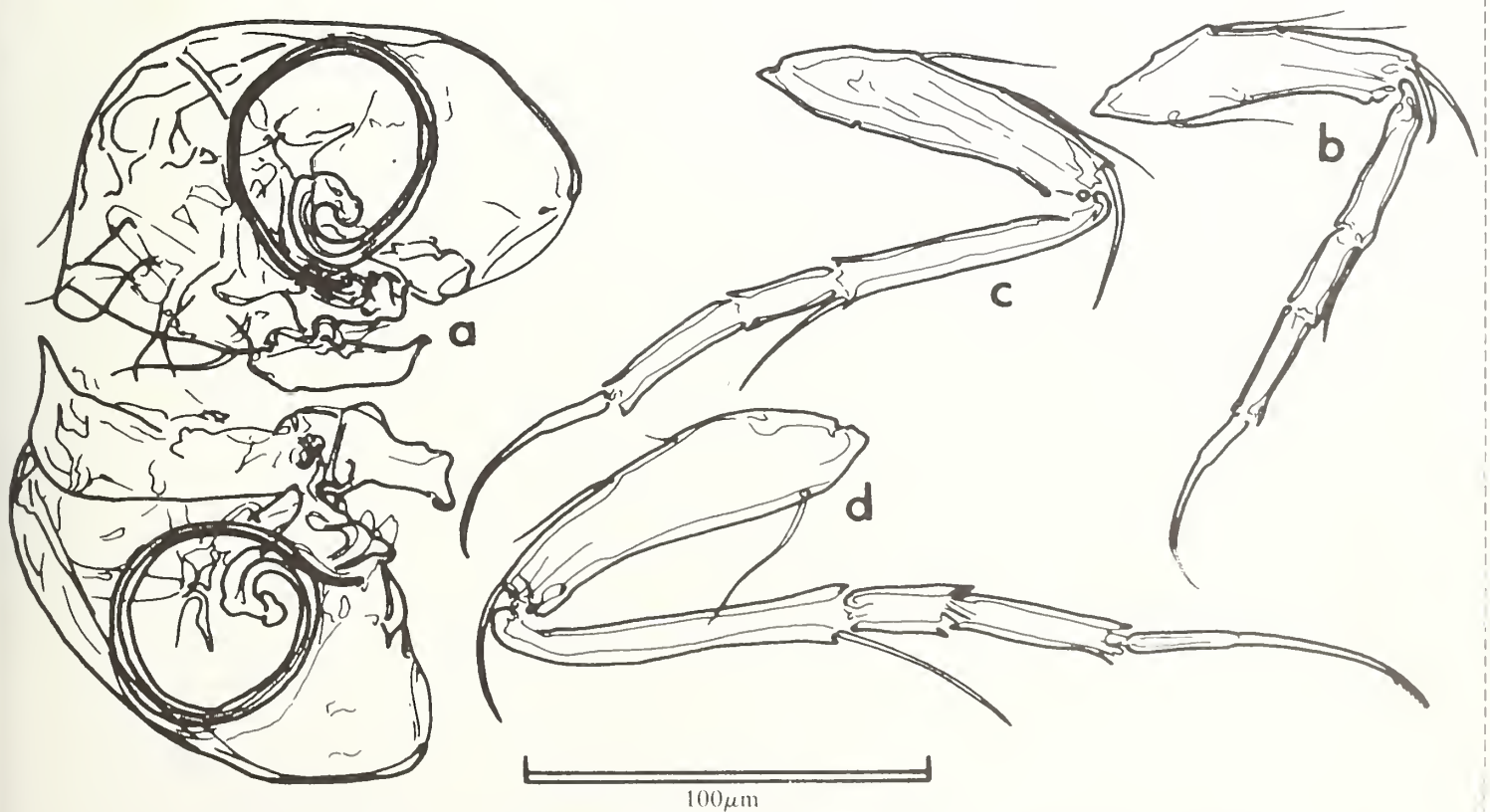
Text-fig. 2

Text-fig. 1, ♂ RV int. seen in transmitted light (1982.127).

Text-fig. 2, ♂ RV int., muscle-scars (1982.3).



Text-fig. 3. ♀ appendages: a, antennula; b, antenna; c, maxillula; d, mandible (1982.5). (Kindly drawn by D. J. Horne.)



Text-fig. 4. a, ♂ copulatory appendage (1982.6); b-d, ♀ legs (1982.5). (Kindly drawn by D. J. Horne.)

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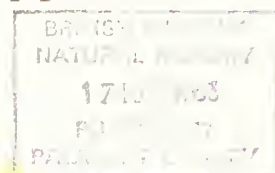
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edited by R. H. Bate, J. W. Neale, Lesley M. Sheppard
and David J. Siveter



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Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Format should follow the style set by the majority of papers in this issue. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only. Blanks to aid in mounting figures for plates may be obtained from any one of the Editors or Editorial Board. Completed papers should be sent to Dr David J. Siveter.

The front cover shows a female left valve, external and internal views, of
Bilobatia serralobata Schallreuter.



ON *HITHIS COLONUS* SCHALLREUTER & SIVETER sp. nov.

by R. E. L. Schallreuter and David J. Siveter
(University of Hamburg, West Germany and University of Leicester, England)

Hithis colonus sp. nov.

- Holotype:** Brit. Mus. (Nat. Hist.) no. **OS 6681**, ♀ RV.
[Paratypes: Brit. Mus. (Nat. Hist.) nos. **OS 6682-91** and Geologisch-Paläontologisches Institut, University of Hamburg no. **2675**].
- Type locality:** Section in field on South side of road, 0.2 km SE of Strasburg Junction, just W of Strasburg, Shenandoah County, Virginia, U.S.A., c. lat. 39° 0' N, long. 78° 22' W. Locality 3 of Whittington & Evitt (*Mem. geol. Soc. Amer.*, **59**, 5, 1954) and Tripp & Evitt (*Geol. Mag.*, **118**, 666, 1982); lower part of Edinburg Formation, middle Ordovician.
- Derivation of name:** Latin *colonus*, inhabitant of a colony; 'Virginia' being named by Sir Walter Raleigh in honour of Queen Elizabeth I.
- Figured specimens:** Brit. Mus. (Nat. Hist.) nos. **OS 6681** (holotype, ♀ RV: Pl. 9, 88, fig. 3), **OS 6682** (♂ LV: Pl. 9, 86, figs. 4, 5; Pl. 9, 88, fig. 4), **OS 6683** (♀ LV: Pl. 9, 88, fig. 2), **OS 6685** (♀ RV: Pl. 9, 88, fig. 1), **OS 6686** (♀ LV: Pl. 9, 86, figs. 1-3; Pl. 9, 88, fig. 5). All specimens are silicified, from the type horizon and locality; material kindly sent for study by Mr. R. Tripp.

Explanation of Plate 9, 86

Figs. 1-3, ♀ LV (**OS 6686**, 1460 µm long): fig. 1, ext. post; fig. 2, ext. lat.; fig. 3, ext. ant. Figs. 4, 5, ♂ LV (**OS 6682**, 1430 µm long): fig. 4, ext. lat.; fig. 5, ext. ant.
Scale A (250 µm; × 40), figs. 1, 3; scale B (250 µm; × 37), fig. 2; scale C (250 µm; × 37), figs. 4, 5.

- Diagnosis:** *Hithis* with L4 as a broad, mostly dorsal inflation in posterior third of domicilium. L3 elongate, tilts backwards, becoming confluent dorsally with L4 and separated from it ventrally by a broad depression (S3). L1 elongate parallel to anterior margin. Dolon from anterior part of ventral to anteroventral regions, strongly convex ("false pouch"), with row of long spines confluent with velum. Velum developed pre-dolonal and post-dolonal as a ridge, bears long spines at least to anterior cardinal corner and also near posterior cardinal corner. Terminations to at least mid ventral-anterior series of spines apparently joined by a 'bar' in both dimorphs. Lobes lack ornament.
- Remarks:** This is the first record of *Hithis* outside Baltoscandia. Two other congeneric taxa are known (Schallreuter, *Palaeontographica* **144**, 76, 1973), the type-species *H. hithis* Schallreuter, 1964 from M Ordovician Backsteinkalk erratic boulders of N Germany and *H. leviconvexus* Schallreuter, 1967 from U Ordovician Öjlemyrflint erratic boulders on Gotland. *Hithis* is thus one of several ostracod genera common to both the European and N American plates during M Ordovician times.

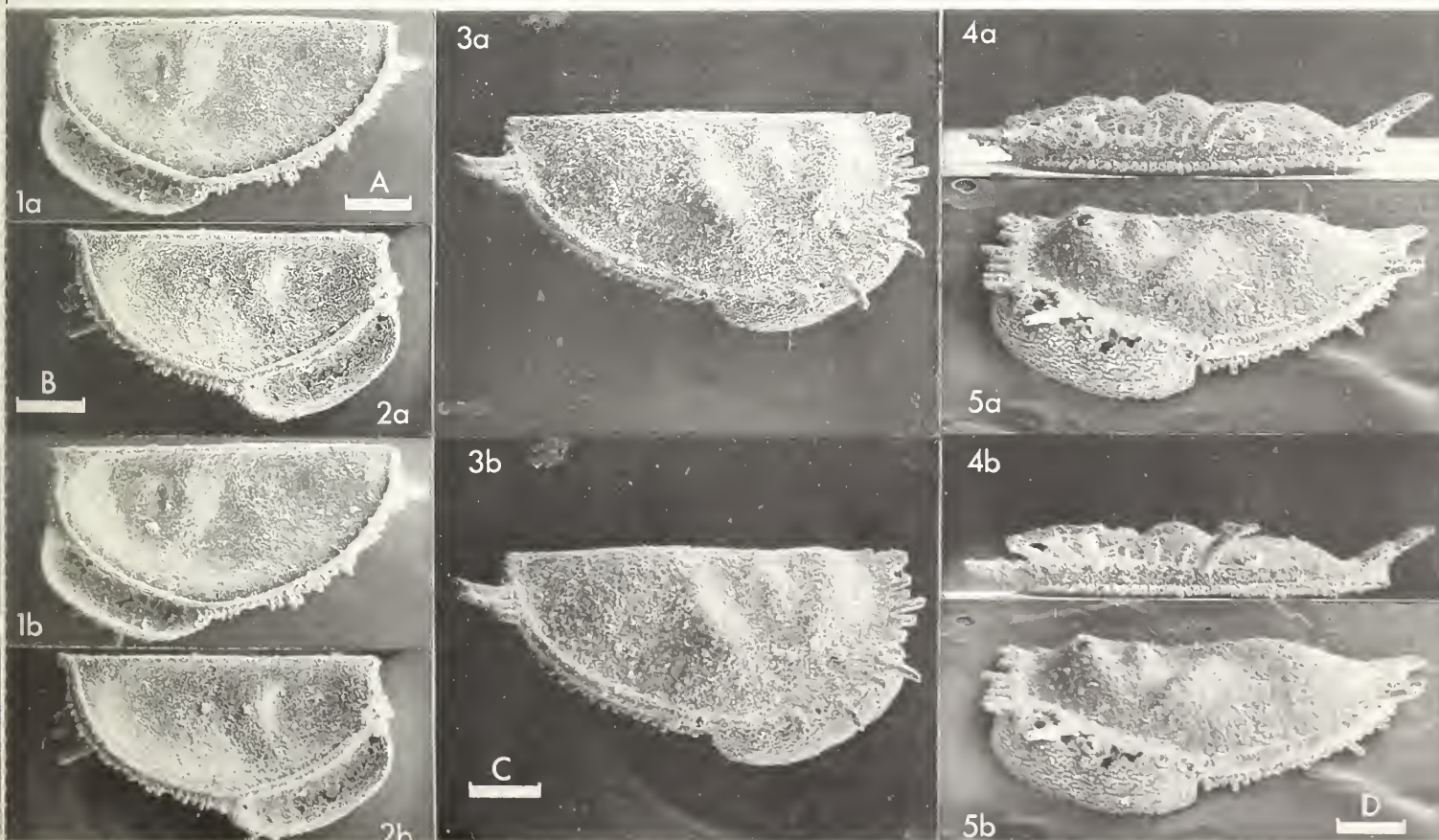
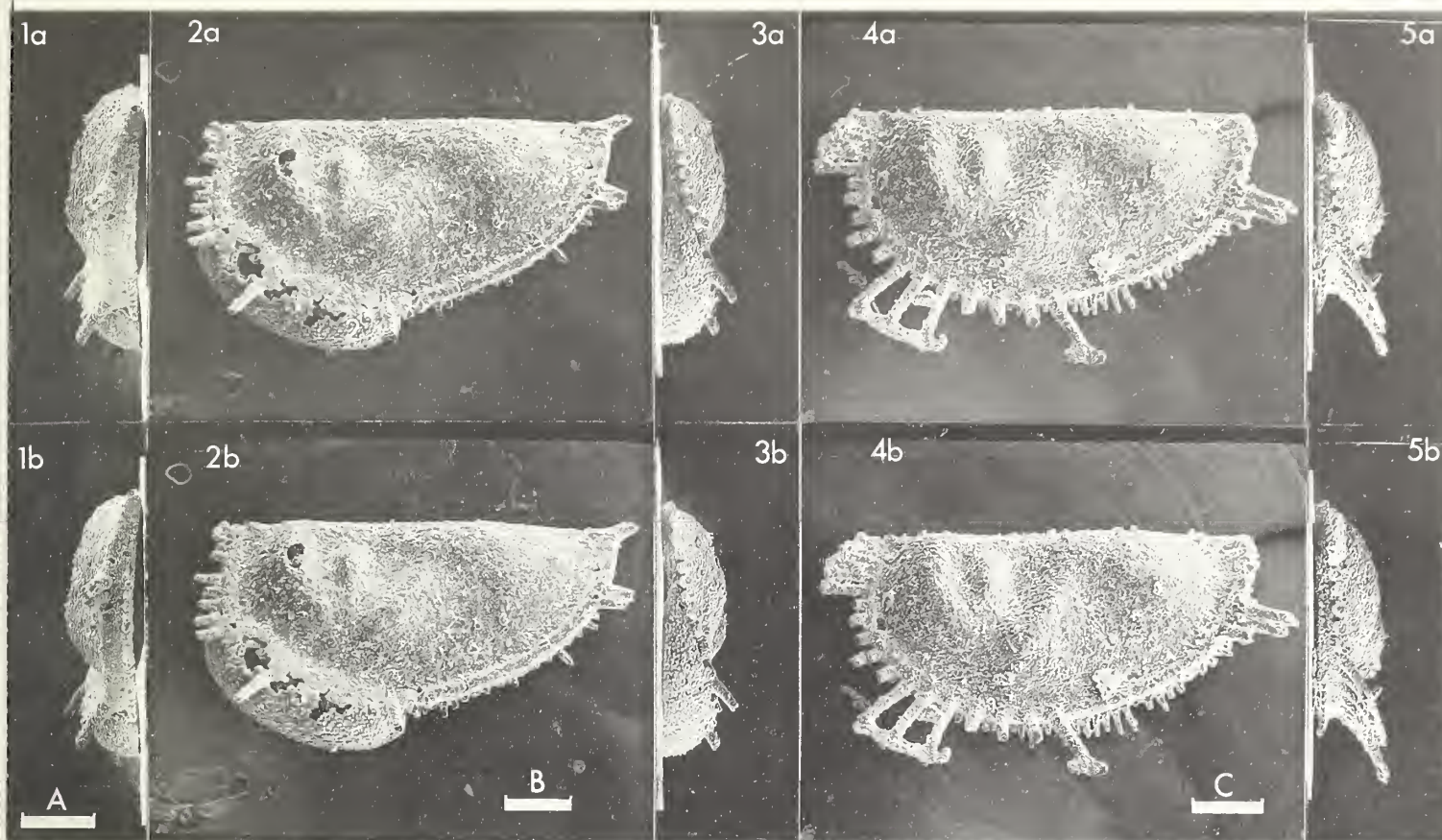
H. colonus is larger than both *H. hithis* (♀ c. 0.74 mm long) and *H. leviconvexus* (♀ c. 1.20 mm long). It most resembles *H. hithis*, which also has a short, strongly convex dolon with a row of spines at about the border of lateral and ventral surfaces, and a similar S2 and preadductor node. Compared to *H. hithis* the dolon in *H. colonus* extends further anteriorly, its dolonal spines are stronger, L1 and L4 are lobes rather than single ventral spine-like nodes, its velum is developed above and behind the dolon as a spinose ridge (cf. only spines in *H. hithis*) and its lateral surface lacks spines or granules.

H. leviconvexus is possibly synonymous with *H. ? mamillosa* Krause (*Z. Deutsch. geol. Ges.*, **44** (3), 393, 1892; cf. Schallreuter *Stereo-Atlas of Ostracod Shells* **6**, 85, 1979). It is distinguished from both congeneric taxa by its weakly convex dolon. *H. colonus* represents a second lineage and possibly a separate subgenus.

Distribution: Known at present only from the type locality.

Explanation of Plate 9, 88

Fig. 1, ♀ RV, int. lat. (**OS 6685**, 1400 µm long); fig. 2, ♀ LV, int. lat. (**OS 6683**, 1450 µm long); fig. 3, ♀ RV, ext. lat. (holotype, **OS 6681**, 1450 µm long); fig. 4, ♂ LV, ext. vent. (**OS 6682**); fig. 5, ♀ LV, ext. vent. obl. (**OS 6686**).
Scale A (300 µm; × 33), fig. 1; scale B (300 µm; × 30), fig. 2; scale C (250 µm; × 37), fig. 3; scale D (250 µm; × 37), figs. 4, 5.



ON *HOMEOKIESOWIA EPICOPA* SIVETER sp. nov.

by David J. Siveter
(University of Leicester, England)

Homeokiesowia epicopa sp. nov.

1978 *Tallinnella* sp. nov. 1; D. J. Siveter, in: R. H. Bate and E. Robinson (Eds.), A Stratigraphical Index of British Ostracoda, *Geol. J.*, special issue 8, 48, pl. 1, figs. 9, 10.

Holotype: Brit. Mus. (Nat. Hist.) no. **OS 6695**, ♀ LV.

Type locality: Old quarry about 300m south of Cwm Agol Farm, about 8km west of Llandeilo, Dyfed, Wales; approx. lat. 51° 51' N, long. 4° 05' W (Nat. Grid. Ref. SN 56552070). Llandeilo 'Flags', Llandeilo Series, M Ordovician.

Derivation of name: Greek, *epikopos*, furnished with oars; fancied resemblance of the nodes and velum to an ancient galley ship.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **OS 6669** (♂ RV: Pl. 9, 90, figs. 2, 3; Pl. 9, 92, fig. 1), **OS 6670** (♀ LV: Pl. 9, 90, fig. 4), **OS 6695** (holotype, ♀ LV: Pl. 9, 90, fig. 1; Pl. 9, 92, fig. 2), **OS 6696** (♀ RV: Pl. 9, 92, figs. 3-5), **OS 6697** (♀ RV: Pl. 9, 92, fig. 6).

All figured specimens are from the type locality and horizon.

Explanation of Plate 9, 90

Fig. 1, ♀ LV, ext. lat. (holotype, **OS 6695**, 2130µm long). Figs. 2, 3, ♂ RV (**OS 6669**, 1840µm long): fig. 2, ext. lat.; fig. 3, ext. post.

Fig. 4, ♀ LV, ext. lat. (**OS 6670**, 1860µm long).

Scale A (500µm; × 25), fig. 1; scale B (500µm; × 30), figs. 2-4.

Diagnosis: Large species of *Homeokiesowia* having small nodes on moderately developed lobes. Dorsal parts of L1, L3 and L4 are bulbous, extending above dorsum. L2 consists of dorsal and ventral nodes connected by weak, sinuous ridge. L4 and the more prominent L3 are ridge-like centrally and each has a ventral node. Female dolon in lateral view extends from posterodorsal region to below posterior base of L3. Valves granulose.

Remarks: The tallinnelline *Homeokiesowia* Schallreuter, 1979 is here recorded from outside the M Ordovician (Viru Series) of Baltoscandia for the first time. *H. epicopa* shows incipient dissolution of its lobes into nodes, a development more completely accomplished in the Estonian type-species, *H. frigida* (Sarv, 1959) (see Schallreuter, *Stereo-Atlas of Ostracod Shells* 6 (15), 75-78, 1979). The lobal morphology in *H. epicopa* represents a more primitive condition than that of congeneric forms. *H. epicopa* further differs from *H. frigida* in its larger size (females can be twice as large), by its shorter dolon which in lateral outline is more abruptly restricted posteroventrally, by the absence of tubercles covering the velum and of spine-like structures above L1 and L2. Both species show well developed infravelar antral dimorphism and have a similar pattern of nodes in front of and behind S2. The only other known congeneric species, *H. pernodosa* Öpik (*Publ. geol. Inst. Univ. Tartu*, 50, 31, 1937) is poorly known, but also displays a more advanced lobal dissolution than in *H. epicopa*.

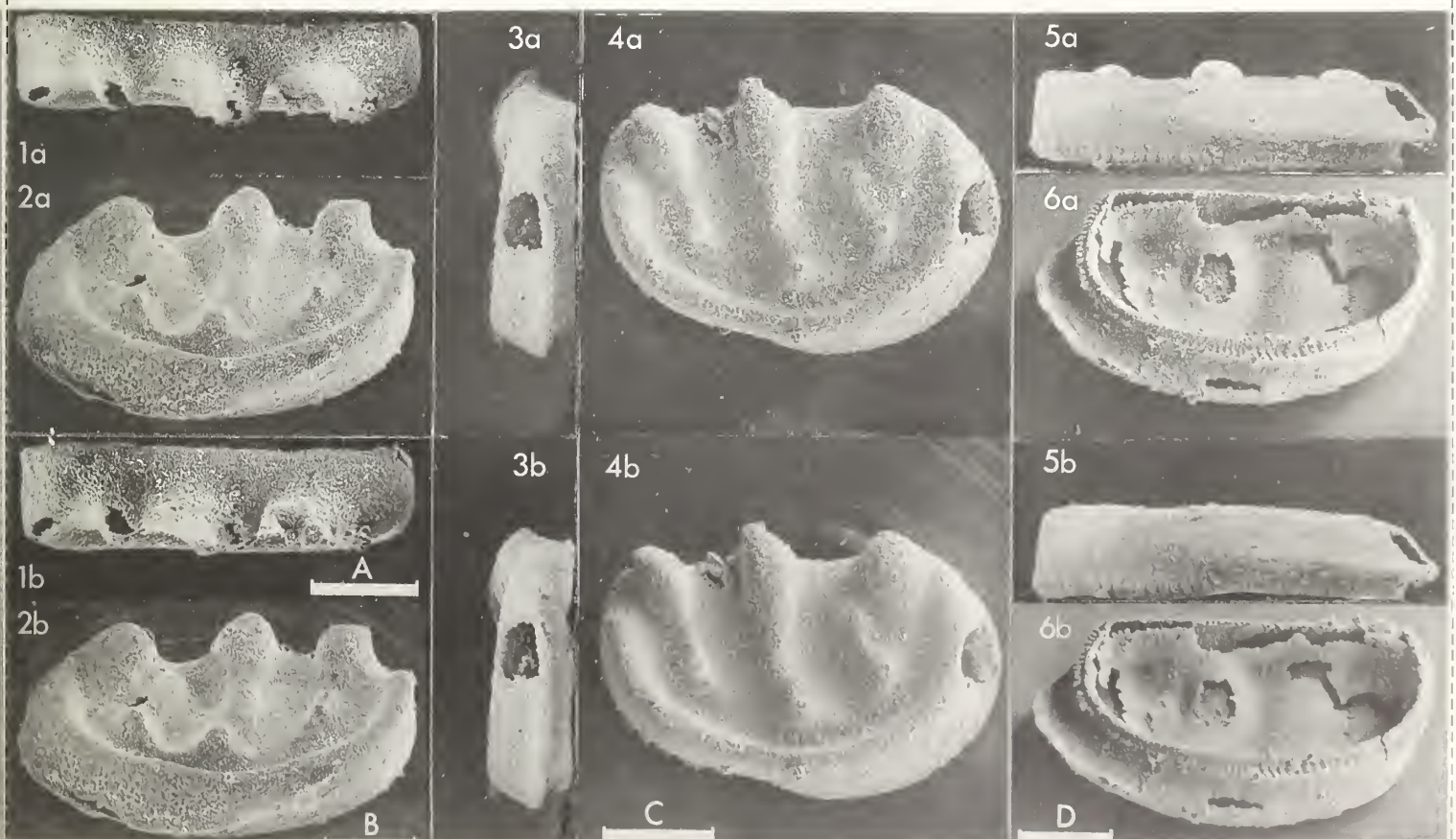
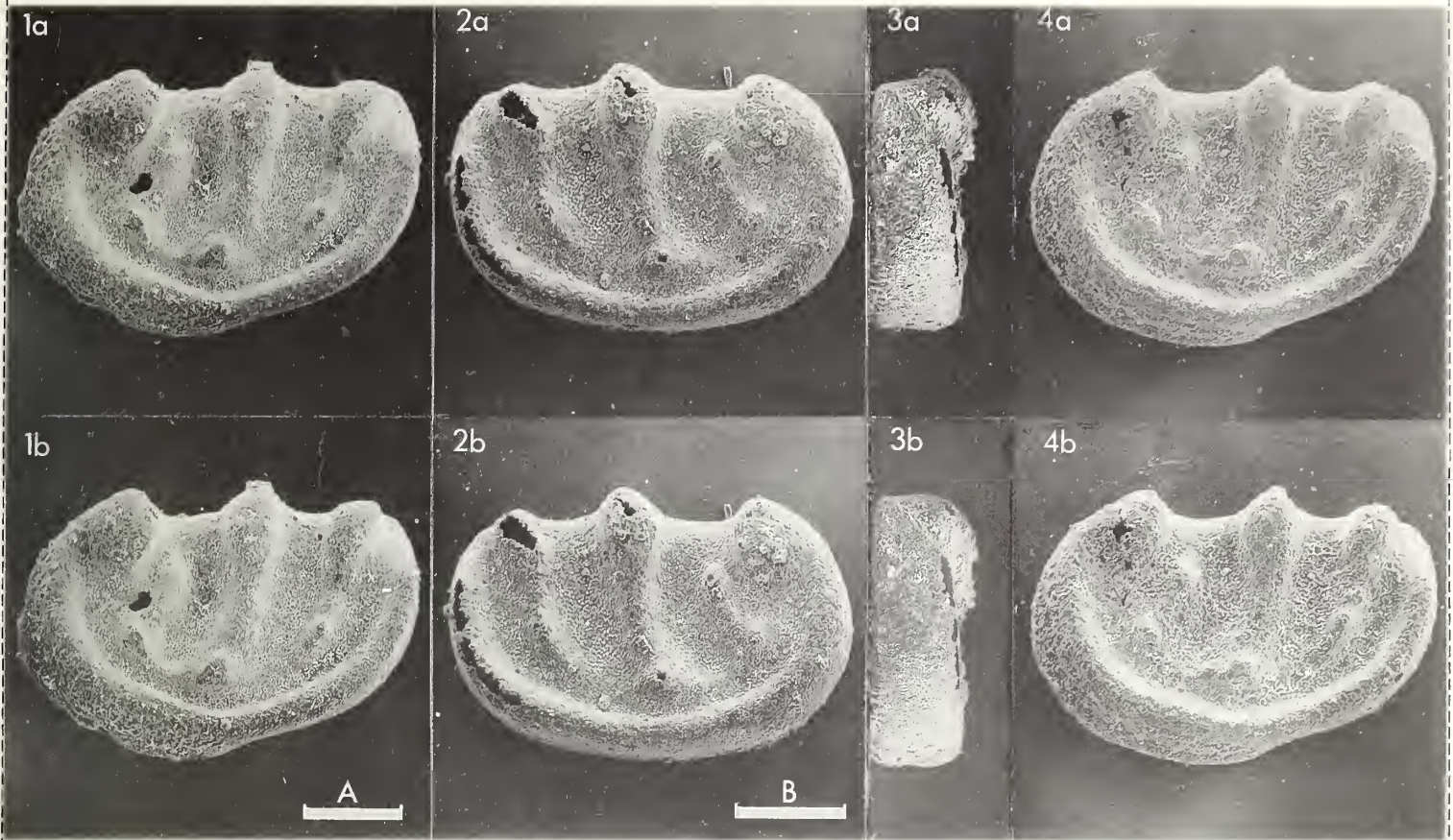
All the known material of *H. epicopa* is silicified. In addition to the figured valves, other material (Brit. Mus. (Nat. Hist.)) includes **OS 6694** and valves labelled "*Tallinnella* sp." in **IO 6257**.

Distribution: Besides the type locality, *H. epicopa* is known at present from one other nearby locality at a similar horizon (C. Jones, pers. comm.).

Explanation of Plate 9, 92

Fig. 1, ♂ RV, ext. dors. (**OS 6669**); fig. 2, ♀ LV, ext. vent. obl. (holotype, **OS 6695**). Figs. 3-5, ♀ RV (**OS 6696** 1910µm long): fig. 3, ext. ant.; fig. 4, ext. lat.; fig. 5, ext. vent. Fig. 6, ♀ RV, int. vent. obl. (**OS 6697**, 2100µm long).

Scale A (500µm; × 30), fig. 1; scale B (500µm; × 25), fig. 2; scale C (500µm; × 30), figs. 3-5; scale D (500µm; × 25), fig. 6.



ON *SCHALLREUTERIA SUPERCILIATA* (REED)

by David J. Siveter
(University of Leicester, England)

Genus *SCHALLREUTERIA* gen. nov.

Type-species: *Beyrichia* (*Ctenobolbina*?) *superciliata* Reed, 1910

Derivation of name: In honour of Dr. R. E. L. Schallreuter, University of Hamburg, for his considerable contribution to our knowledge of Ordovician ostracods.

Diagnosis: Wehrliinae with four distinct, non-cristate lobes. Anterior and postadductorial lobes (L1, L3) project as cusps well above the dorsal margin; L4 widest and with a low cusp, L3 slender, L2 diminutive. Infravelar antral dimorphism; females with long convex, sausage-shaped dolon, with fine transverse external 'ribbing' and a row of fine peripheral spines having a grill-like appearance. Velum in tecnomorphs has rows of small spines. Valves granulose and tuberculate-spinose.

Explanation of Plate 9, 94

Figs. 1-3, ♂RV (A109790a, 2050µm long): fig. 1, ext. ant., ornament on velum and ant. lobe; fig. 2, ext. lat.; fig. 3, ornament on L3-L4. Scale A (100µm; × 100), fig. 1; scale B (500µm; × 34), fig. 2; scale C (100µm; × 135), fig. 3.

Remarks: *Rakverella* Öpik (*Publ. geol. Inst. Univ. Tartu* **50**, 45, 1937) and *Pectidolon* Schallreuter (*Geologie*, **15**, 205, 1966) show closest morphological similarity to *Schallreuteria*, which differs particularly in its more well defined, non-cristate quadrilobation and by its wider and less markedly grill-like dolonal periphery. In dolonal and velar morphology *Schallreuteria* displays typical wehrliine characteristics and is the first recorded representative of the subfamily from outside Baltoscandia.

The special kind of antral dimorphism which typifies the Wehrliinae Schallreuter (*Ber. geol. Ges. D.D.R.*, **10** (4), 484, 1965) is most spectacularly displayed in *Bilobatia* Schallreuter, 1976 (see Schallreuter, *Stereo-Atlas of Ostracod Shells*, **9** (2), 9-16, 1982).

Schallreuteria superciliata (Reed, 1910)

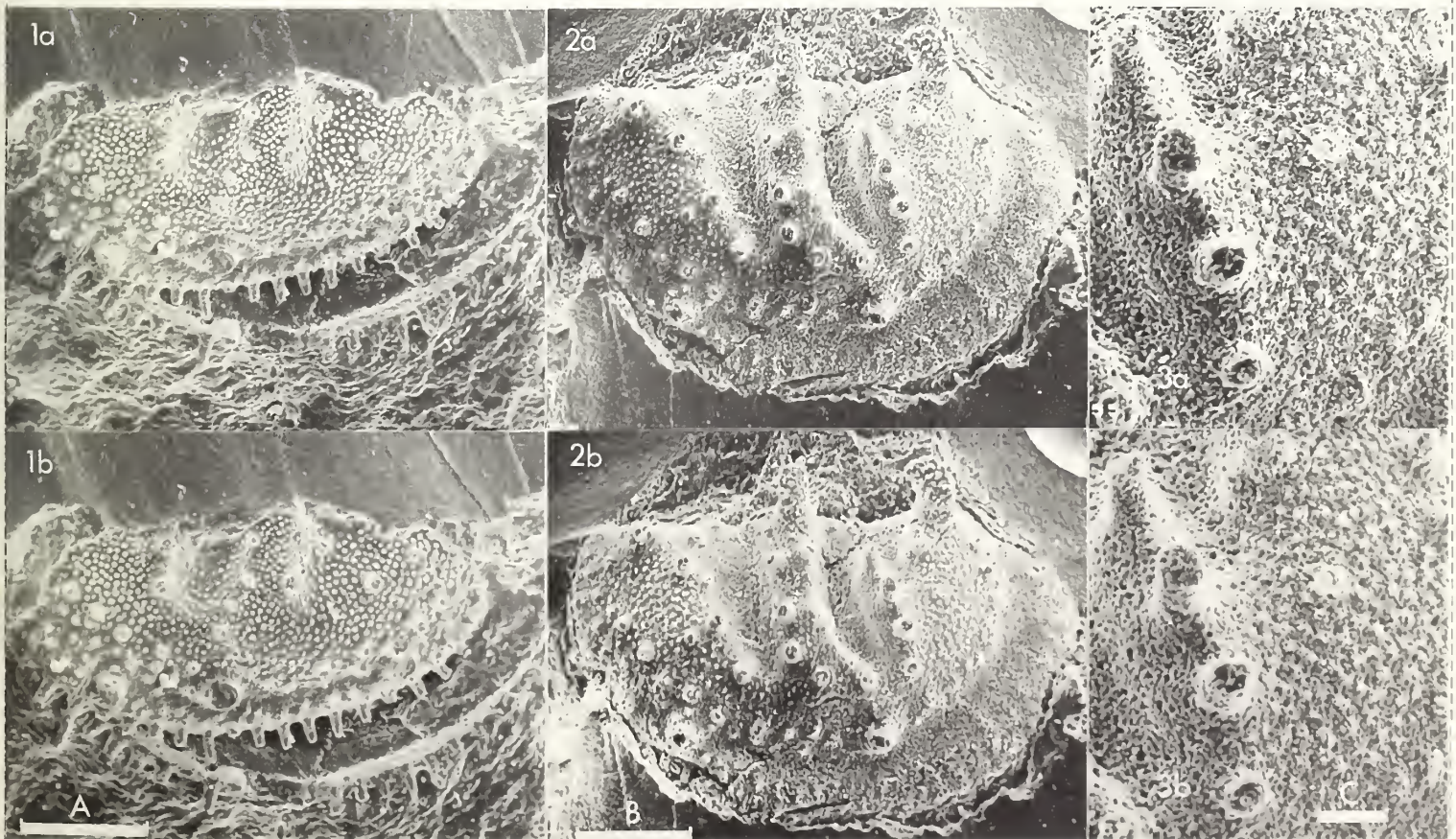
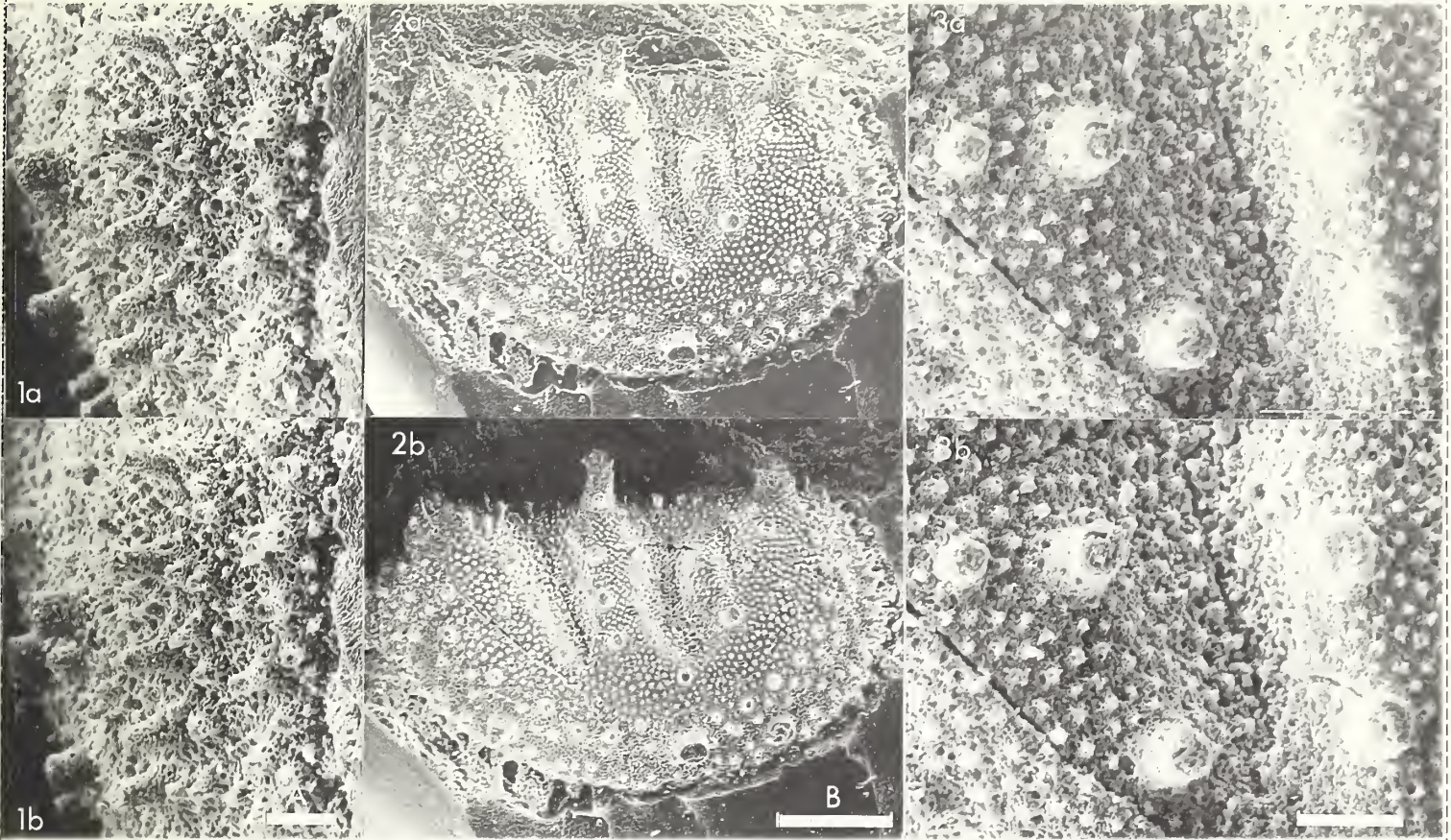
- 1910 *Beyrichia* (*Ctenobolbina*?) *superciliata* sp. nov. F. R. C. Reed, *Geol. Mag.*, (5), **7**, 218, pl. 17, figs. 14, 14a.
1910 *Beyrichia* (*Tetradella*) *Turnbulli* sp. nov. F. R. C. Reed, *Geol. Mag.*, (5), **7**, 219, pl. 17, figs. 12, 12a, 13, 13a.
1934 *Ctenobolbina superciliata* (Reed); R. S. Bassler & B. Kellett, *Spec. Pap. geol. Soc. Am.*, **1**, 53, 207.
1934 *Tetradella turnbulli* (Reed); R. S. Bassler & B. Kellett, *Ibid.*, **1**, 210, 483.
1947 *Tetradella superciliata* (Reed); J. C. Harper, *Geol. Mag.*, **84**, 350, pl. 10, fig. 6.
1978 '*Beyrichia*' *superciliata* Reed, 1910; D. J. Siveter, in: R. H. Bate & E. Robinson (Eds.), *A Stratigraphical Index of British Ostracoda*, *Geol. J.*, special issue **8**, 52, pl. 3, figs. 3, 4, 6.

Lectotype: (here designated). Sedgwick Museum, University of Cambridge no. **A10985 a-b**; tecnomorphic RV external and internal moulds, Reed, pl. 17, figs. 14, 14a, 1910. For a lectotype designation of '*B.*' *turnbulli* see Remarks below.

Explanation of Plate 9, 96

Fig. 1, part ♂LV, ext. lat. (A109790b; length visible 1880µm). Figs. 2, 3, ♀RV (A29968b, 2250µm long): fig. 2, ext. lat.; fig. 3, ornament on L1-L2.

Scale A (500µm; × 34), fig. 1; scale B (500µm; × 31), fig. 2; scale C (100µm; × 86), fig. 3.



Type locality: Near Alston road, c. 1 km NE of Melmerby, Cumbria, England, Nat. Grid Ref.: NY 62313832; approx. lat 54° 44' N long. 2° 35' W. See W. T. Dean (*Proc. Yorks. geol. Soc.*, **32**, 210-14, 1959). Melmerby Beds (= Part of the Dufton Shales), Longvillian, Caradoc Series, Ordovician.

Figured specimens: Sedgwick Museum, University of Cambridge nos. **A109790a** (♂ RV: Pl. 9, 94, figs. 1-3), **A109790b** (♂ LV: Pl. 9, 96, fig. 1), **A29968b** (♀ RV: Pl. 9, 96, figs. 2, 3), **A10983b** (♀ RV: Pl. 9, 98, figs. 1-4; Pl. 9, 100, fig. 1), **A10984b** (♀ RV: Pl. 9, 100, fig. 2), **A10985b** (lectotype, tecnomorphic RV: Pl. 9, 100, fig. 3).

All specimens form part of Reed's original material and are from the type locality.
Diagnosis: Species of *Schallreuteria* with prominent single spines adjacent to adventral structure: in both dimorphs one spine occurs below S2 and one posteroventrally, male has third spine below L1. Sulci irregularly granulose to smooth; discrete tubercles, often arranged in rows, occur along lobes.

Explanation of Plate 9, 98

Figs. 1-4, ♀ RV (lectotype of '*B.*' *turnbulli*, **A10983b**, 2120µm long): fig. 1, ext. lat.; fig. 2, ornament on S2-L3; fig. 3, syllobial ornament; fig. 4, peripheral spines on dolon.

Scale A (500µm; × 33), fig. 1; scale B (100µm; × 120), fig. 2; scale C (50µm; × 185), fig. 3; scale D (50µm; × 200), fig. 4.

Remarks: All known material consists of moulds and the delicate lobal cusps are sometimes not preserved in the casts (cf. females Pl. 9, 96, fig. 2 and Pl. 9, 98, fig. 1). Based on Reed's only figured (tecnomorph) specimen of '*B.*' *superciliata* (lectotype designated above) and his two figured (female right) valves of '*B.*' *turnbulli* (lectotype here designated: **A10983a-b** = Reed 1910, pl. 17, figs. 12, 12a) the two species are considered synonymous. This fact but not the dimorphic nature of the taxa, was recognised by Harper (1947), who attributed the specific differences described by Reed to factors of preservation. The figures in Reed's paper were printed 'in reverse'; all 3 valves are re-illustrated herein. Conspecific material consists of **A10984a-b** (♀ RV: Reed 1910, pl. 17, figs. 13, 13a), **A29967a-b** (tecnomorph LV), **A29968a-b** (♀ RV), and **A109790a-b** (incomplete tecnomorph carapace).

Harper (1947, 350) incorrectly used the term 'holotype' for Reed's only figured valve of '*B.*' *superciliata*. The second syntype of '*B.*' *superciliata*, **A29971a-b** (tecnomorph RV) is not conspecific with the designated lectotype and probably belongs to *Rigidella*.

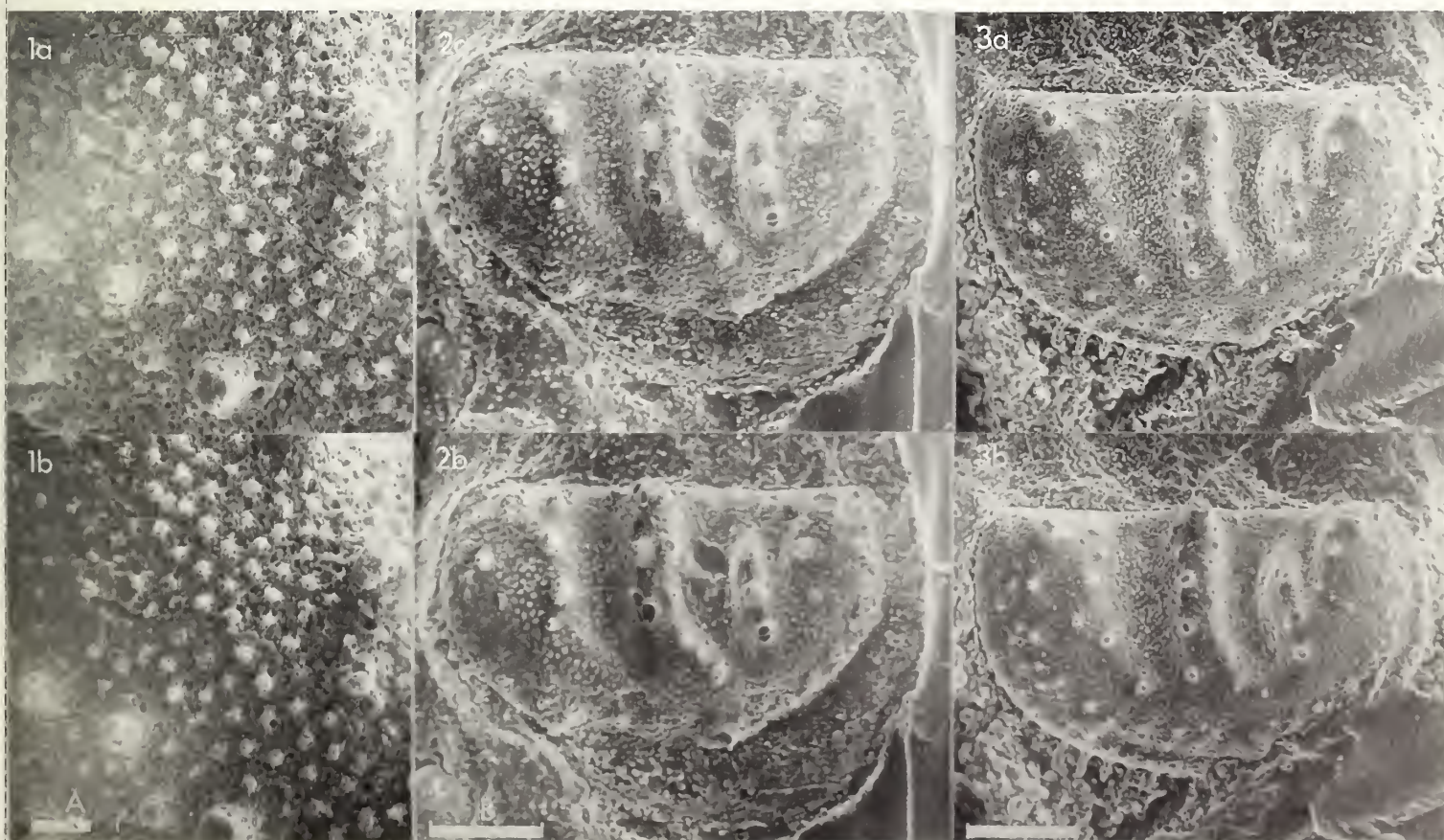
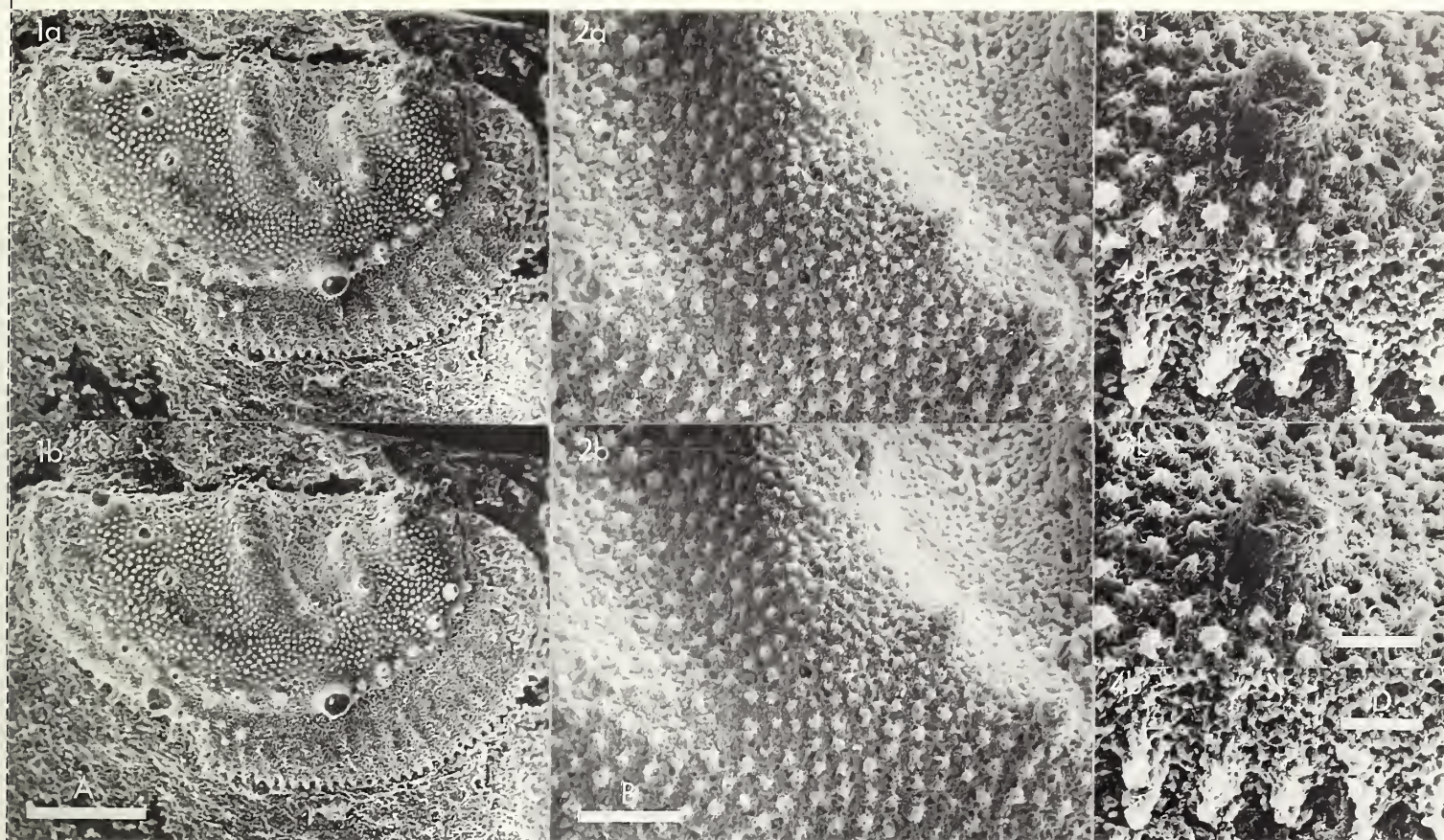
In adults of *S. superciliata* the development of tubercles varies. There can be 3-4 conspicuous tubercles aligned respectively along L2, the posterior part of L3 and the anterior part of L4 (e.g. Pl. 9, 96, fig. 2) though the full complement of tubercles is lacking in some adults (e.g. Pl. 9, 98, fig. 1).

Distribution: Known with certainty only from the type locality in the Cross Fell inlier. *Tetradella* cf. *superciliata* is recorded from the Longvillian of the Harthwaite Sike section of the same inlier (Dean 1959, 207).

Explanation of Plate 9, 100

Fig. 1, ♀ RV, syllobial ornament (**A10983b**); fig. 2, ♀ RV (**A10984b**, 2230µm long); fig. 3, tecnomorph RV, ext. lat. (lectotype of '*B.*' *superciliata*, **A10985b**, 1975µm long).

Scale A (100µm; × 120), fig. 1; scale B (500µm; × 31), fig. 2; scale C (500µm; × 31), fig. 3.



ON *CONCAVHITHIS LATOSULCATUS* SCHALLREUTER gen. et sp. nov.

by Roger E. L. Schallreuter
(University of Hamburg, German Federal Republic)

Genus *CONCAVHITHIS* gen. nov.

Type-species: *Concavhithis latosulcatus* sp. nov.

Derivation of name: Latin, *concavus*, concave and the generic name *Hithis*, alluding to the concave posterior ventral margin. Gender masculine.

Diagnosis: A medium-sized, unisulcate genus of Sismoopsinae. Free margin in posterior half of centroventral region concave. Nearly unisulcate; S2 in dorsal half very broad and deep, ventrally small, narrower and not very deep; S1 almost obsolete, S3 a weak sulcus or a semisulcus. Field (= L4) posterior of S3 much closer to the contact plane than field anterior of S3. L1 and L2 virtually fused, preadductorial node discernable. L3 consisting of a posteroventral lobe and a dorsal bulb-like lobal spine. Tecnomorphs with a keel-like velum. Females with a small velar flange and a velar antrum, and a histial ridge without an antrum. Marginal sculpture on both valves appears as a normal or small flange-like ridge. Lateral surface punctate to reticulate. Marginal surface reticulate except for the velar antrum. Histial canaliculus with a row of puncta.

Remarks: *Concavhithis* is considered a descendant of *Sismoopsis* and is distinguished from it by several features but the main difference is its spine-like dorsal L3. In the typical *Sismoopsis* species the males possess a histial ridge and the females a histial flange with a histial antrum.

Explanation of Plate 9, 102

Figs. 1, 2, tecnomorphic RV (holotype, **GPIMH 2678**, 1005µm long); fig. 1, ext. lat.; fig. 2, ext. vent. obl.
Scale A (100µm; × 99), figs. 1, 2.

Remarks (contd): One evolutionary trend in *Sismoopsis* is to reduce the histial sculptures. In one of the youngest species, *S. granulata*, the male histium is still present but developed only as a brim whereas the velum is developed as a distinct keel. In the females of *S. granulata* the histium is developed as a flange-like keel but there is no histial antrum, only a canaliculus with a row of puncta.

Concavhithis latosulcatus sp. nov.

Holotype: Geologisch-Paläontologisches Institut und Museum, University of Hamburg, no. **2678**, tecnomorphic RV.
[Paratypes: nos. **2679-2682**].

Type locality: Upper Ordovician Öjlemyrflint erratic boulder no. Sy156 of the Upper Kaolinsand (Lower Pleistocene), near Braderup, Isle of Sylt (N Frisian Is., N Sea), Germany; lat 54° 56'N, long. 8° 21'E.

Derivation of name: Latin, *latus*, broad and *sulcatus*, sulcate; alluding to the broad S2.

Figured specimens: Geologisch-Paläontologisches Institut und Museum, University of Hamburg (**GPIMH**) nos. **2678** (tecnomorphic RV: Pl. 9, 102, figs. 1, 2), **2679** (fragmentary tecnomorphic (?) RV: Pl. 9, 104, fig. 1), **2680** (incomplete tecnomorphic LV: Pl. 9, 104, fig. 2) and **2681** (fragmentary ♀ RV: Pl. 9, 104, fig. 3). All specimens are from the type locality; boulder coll. by Ulrich von Hacht, 1981.

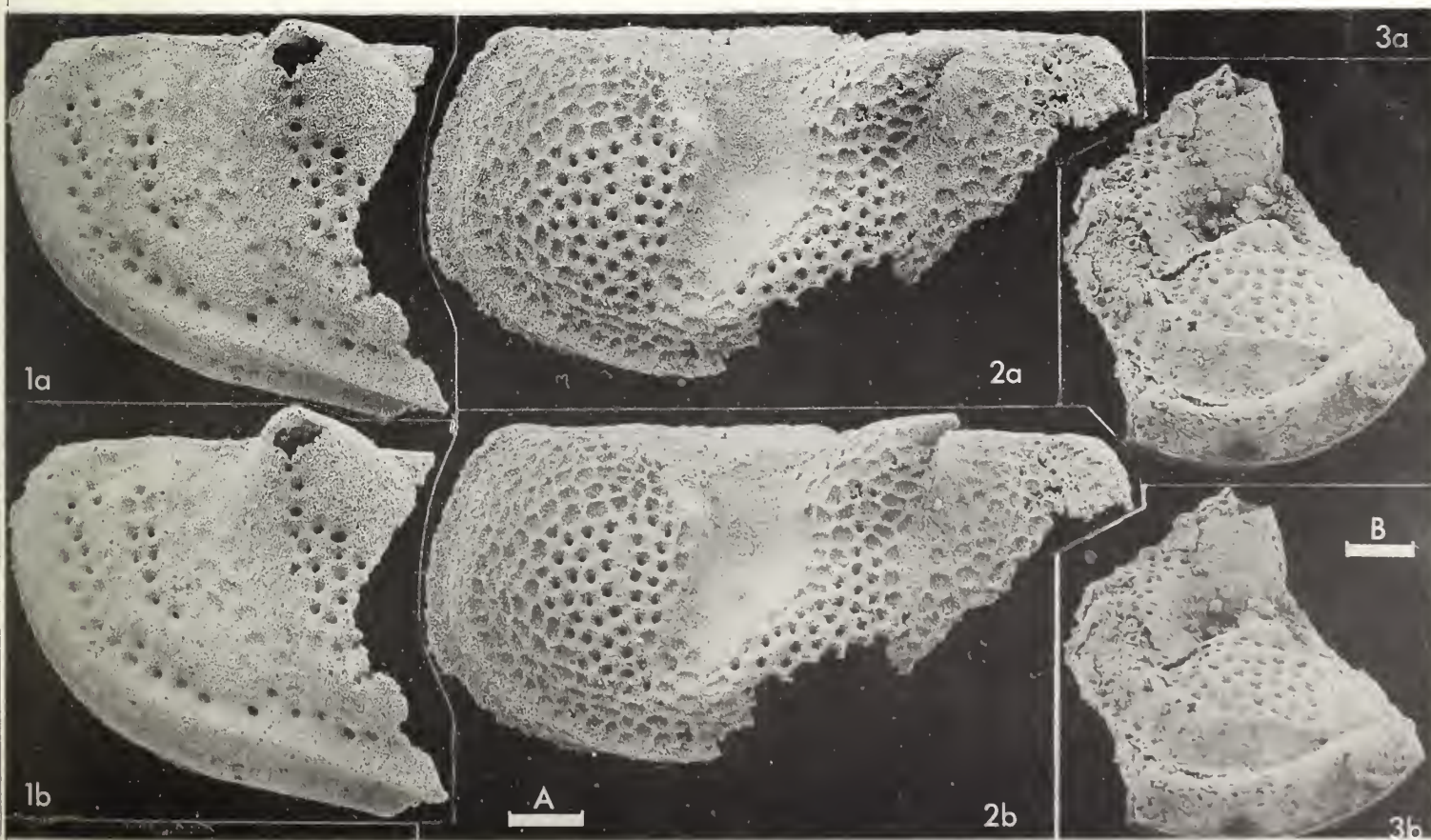
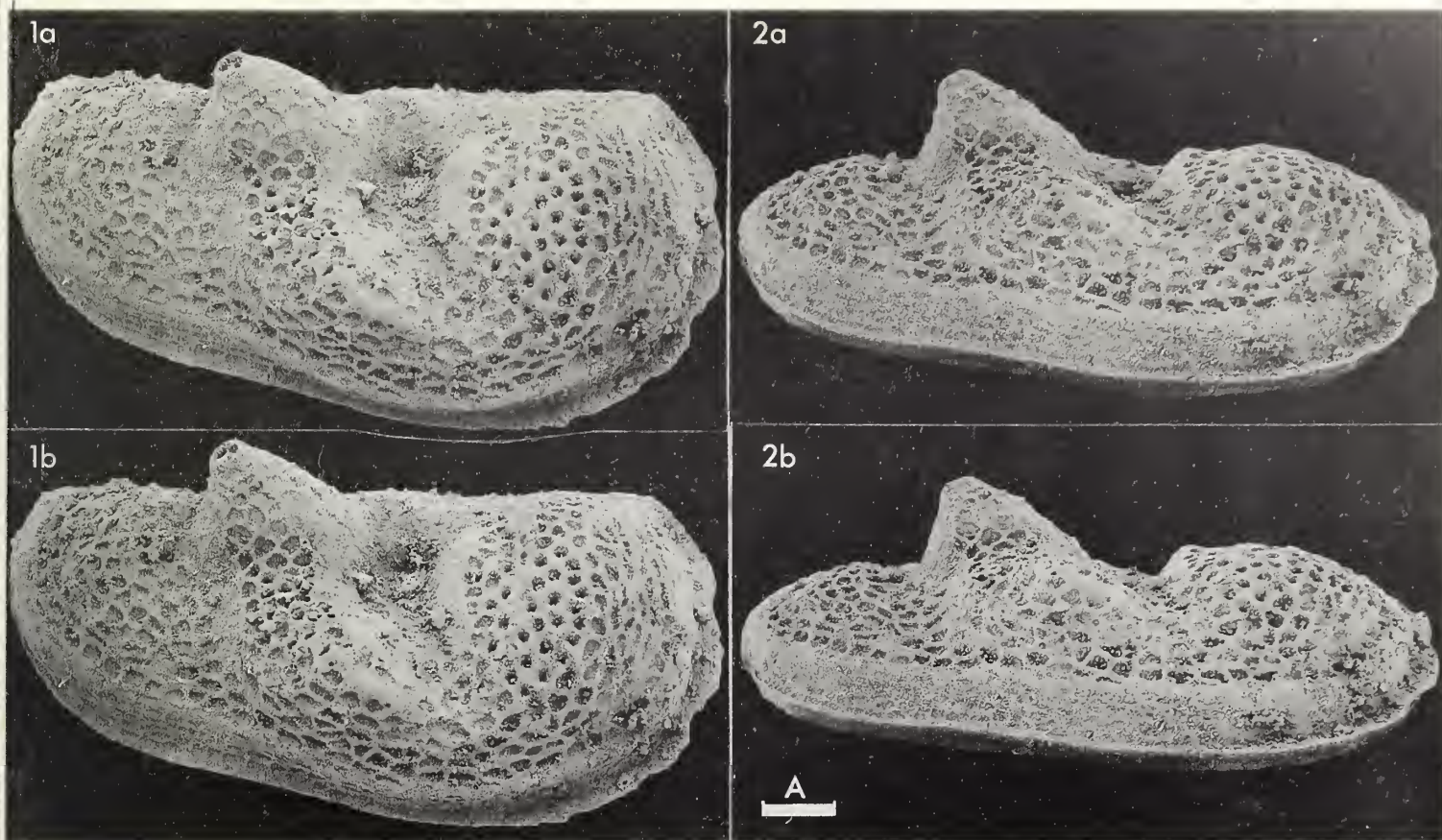
Diagnosis: As for the genus.

Remarks: *Concavhithis latosulcatus* is another example of a palaeocope with a ventricular concavity. Other examples are *Disulcina* ? *longissima* Schallreuter (*N. Jb. Geol. Paläont. Mh.* **1971** (11), figs. 1.1-3), *Wehrliia olbertzae* Schallreuter (*Ber. geol. Ges. DDR* **10** (4), 484, pl. 11, fig. 2, 1965 and *Palaeontographica* (A) **153** (4/6), 208, pl. 42 (= 9), fig. 1, 1976) and *Tetrada ventroconcava* Schallreuter, 1976 (*op. cit.*, 174-5, pl. 35 (= 2), figs. 19, 20). Ventricular concavities in palaeocopes are rare exceptions of no great taxonomic significance.

Distribution: Known only from the type locality.

Explanation of Plate 9, 104

Fig. 1, fragmentary (tecnomorphic ?) RV, ext. lat. (paratype, **GPIMH 2679**); fig. 2, incomplete tecnomorphic LV, ext. lat. (paratype, **GPIMH 2680**, 975µm long); fig. 3, fragmentary ♀ RV, ext. ant. obl. (paratype, **GPIMH 2681**).
Scale A (100µm; × 101), figs. 1, 2; scale B (100µm; × 80), fig. 3.



ON *GELLENSIA NODORETICULATA* SCHALLREUTER sp. nov.

by Roger E. L. Schallreuter
(University of Hamburg, German Federal Republic)

Gellensia nodoreticulata sp. nov.

- Holotype:** Geologisch-Paläontologisches Institut und Museum, University of Hamburg, no. **2683**, ♀LV.
[Paratype: no. **2685**, tecnomorphic RV].
- Type locality:** Upper Ordovician Öjlemyrflint erratic boulder no. Sy56 of the Upper Kaolinsand (Lower Pleistocene), near Braderup, Isle of Sylt (N Frisian Is., N Sea), Germany; lat. 54° 56' N, long. 8° 21' E.
- Derivation of name:** Latin, *nodus*, node and *reticulatus*, reticulate; alluding to the reticulate preadductorial node.
- Figured specimens:** Geologisch-Paläontologisches Institut und Museum, University of Hamburg (**GPIMH**) nos. **2683** (incomplete ♀LV: Pl. 9, 106, figs. 1, 2) and **2684** (nearly complete tecnomorphic RV: Pl. 9, 106, figs. 1, 2). No. **2683** is from the type locality; coll. by Ulrich von Hacht, 1977. No. **2684** is from the upper Ordovician Öjlemyrflint erratic boulder no. G13 from the beach at Häftings, Isle of Gotland (Baltic Sea), lat. 57° 53' N, long. 18° 37' E; coll. by Horst Kaufmann, 1975.

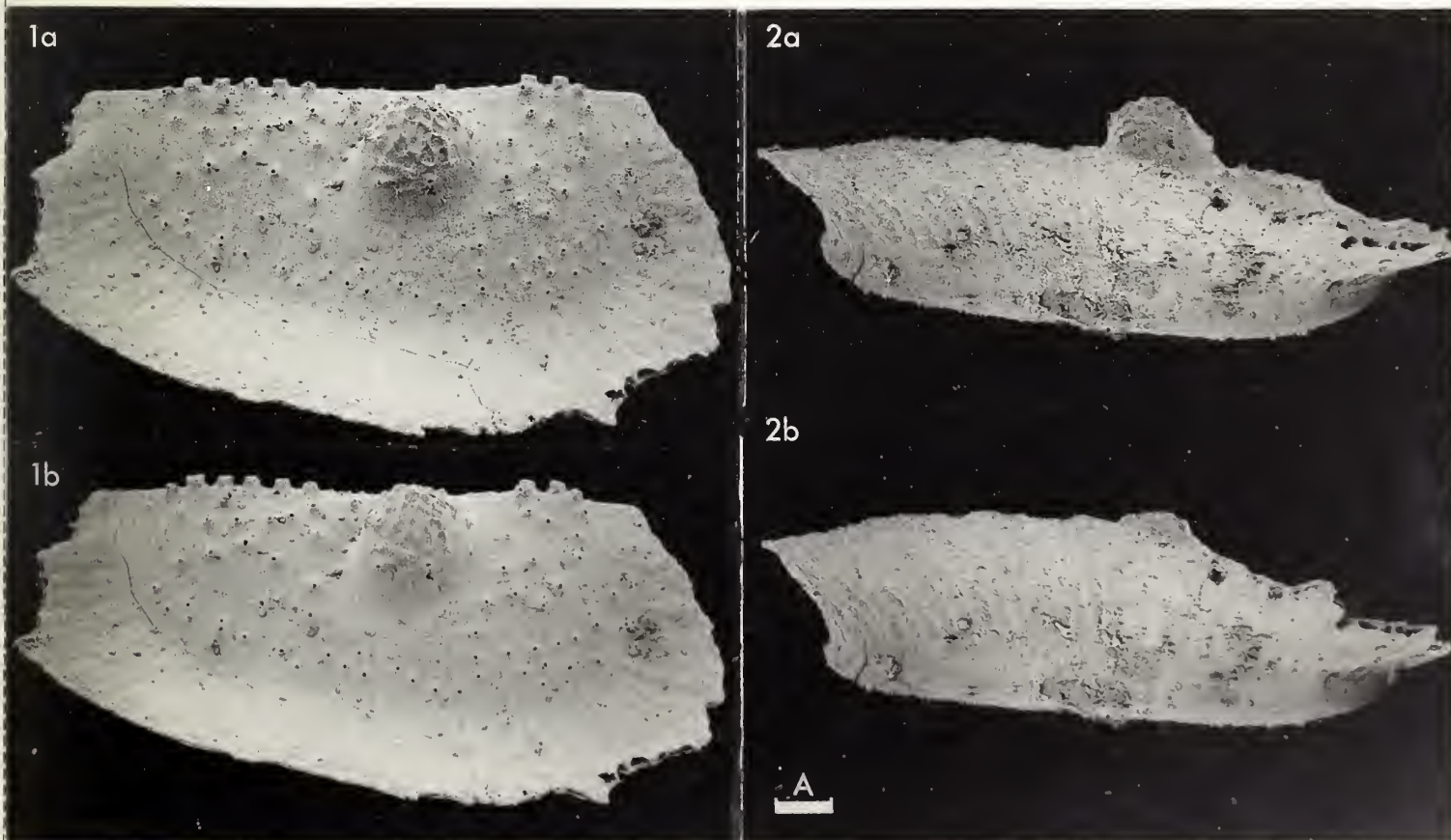
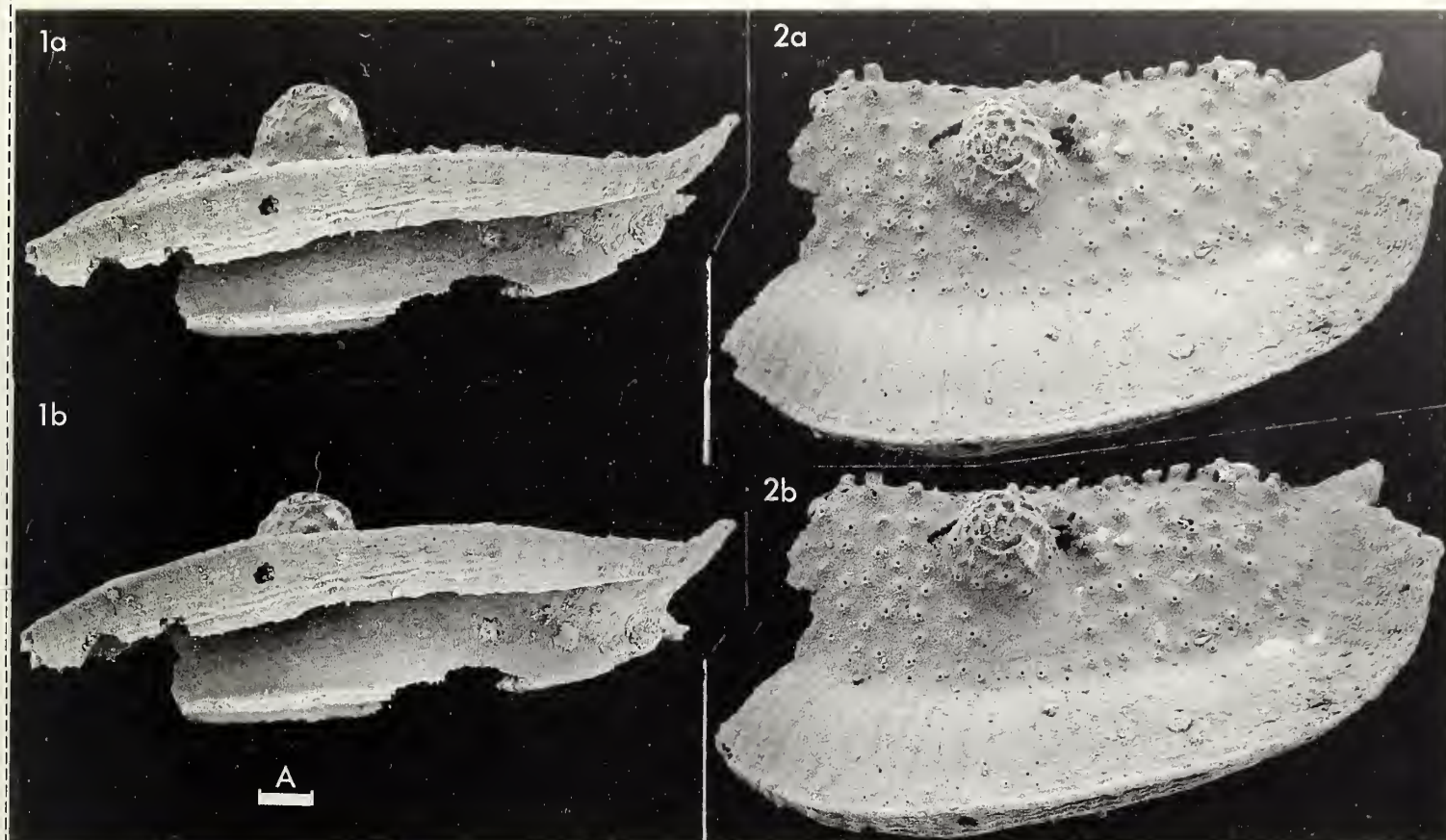
Explanation of Plate 9, 106

Figs. 1, 2, incomplete ♀LV (holotype, **GPIMH 2683**, 1315µm long): fig. 1, ext. vent.; fig. 2, ext. lat.
Scale A (100µm; × 76), figs. 1, 2.

- Diagnosis:** Species of *Gellensia* with females a little more than 1.32 mm long. Velar frill nearly entire, narrowing in the dorsal regions, more so posterodorsally than anterodorsally. Marginal sculpture appears as a ridge. Preadductorial node reticulate, lateral surface pustulate.
- Remarks:** *Gellensia nodoreticulata* differs from the Middle Ordovician type-species, *G. gellensis* Schallreuter (*Geologie* 16 (5), 617, 1967), mainly by its reticulate preadductorial node, its pustulate lateral surface, its ridge-like marginal sculpture and especially its posteriorly longer velar frill. *G. gotlandica* Schallreuter (*op. cit.*, 618) has a relatively higher domicilium, a posteriorly shorter velar frill and a spinose lateral surface.
- Gellensia nodoreticulata* very much resembles *Cystomatochilina*. *Gellensia*, *Cystomatochilina* and the related *Platybolbina* all show a phylogenetic trend to extend the velar frill to the cardinal corners. In *Platybolbina* (*Reticulobolbina*) and *Gellensia* the frill is restricted in the Middle Ordovician species and entire but narrow at the cardinal corners in the Upper Ordovician species (Schallreuter, *Geologie* 18 (7), 879, 1969). In *Cystomatochilina* the frill is entire and clipped at the cardinal corners even in the Middle Ordovician *C. matura* Schallreuter (*Ber. geol. Ges. DDR*, 10 (4), pl. 9, fig. 2, 1965; *Palaeontographica* (A), 149 (4/6), pl. 22 (1), fig. 2, 1975). In the Upper Ordovician type-species *C. umbonata* (Krause) the frill is entire and also very broad at the cardinal corners (Jaanusson, *Bull. geol. Inst. Univ. Upsala* 37 (3/4) = *Publ. Palaeont. Instn. Univ. Upsala* 17, fig. 16, 1957).
- Cystomatochilina umbonata* of Sarv (*Eesti NSV Tead. Akad. Geol. Inst. uurimused* 9, pl. 1, fig. 1, 1962) from the Porkuni Stage (F₂) of Estonia is perhaps a tecnomorphic valve of *Gellensia nodoreticulata* but the characteristic preadductorial node and the diagnostic dorsal parts of the velar frill are broken away.
- Distribution:** Öjlemyrflint (Upper Ordovician) erratic boulders of the Isle of Gotland (Baltic Sea) and of the Upper Kaolinsand (Lower Pleistocene) of the Isle of Sylt (N Frisian Is., N Sea).

Explanation of Plate 9, 108

Figs. 1, 2, nearly complete tecnomorphic RV (**GPIMH 2684**, 1245µm long): fig. 1, ext. lat.; fig. 2, ext. vent.
Scale A (100µm; × 80), figs. 1, 2.



ON *AIRINA AMABILIS* (NECKAJA)

by Roger E. L. Schallreuter
(University of Hamburg, German Federal Republic)

Airina amabilis (Neckaja, 1958)

- 1958 *Dilobella amabilis* sp. n. A.I. Neckaja, *Trudŭ vses. nefi. nauchno-issled. geol.-razv. Inst. (VNIGRI)*, **115** (= *Mikrofauna SSSR* **9**), 349-350, pl. 1, figs. 20, 21.
- 1959 *Brevibolbina amabilis* (Neckaja); L. I. Sarv, *Eesti NSV Tead. Akad. Geol. inst. uurimused*, **4**, 142-144, 193, tab. 2 (189), pl. 25, figs. 1-4, text-fig. 14B.
- 1960 *Brevibolbina amabilis* (Neckaja); L. I. Sarv, *Ibid.*, 5, tab. 1.
- non 1966 *Brevibolbina amabilis*; R. M. Männil, *Istoriya razvitiya Baltijskogo bassejna v ordovike (Evolution of the Baltic Basin During the Ordovician)*, 52 (? 1967).
- 1970 *Brevibolbina amabilis* (Neckaja); A. Rõõmusoks, *Stratigrafija viruskoj i charjuskov serij (ordovik) Severnoj Estonii I (Stratigraphy of the Viruan Series (Middle Ordovician) in Northern Estonia)*, 135, 152, 153, 196, 260, tabs. 10 (178), 12 (219), 15 (296).
- 1973 *Dilobella amabilis* Neckaja; R. E. L. Schallreuter, *Palaeontographica* (A), **144** (1/3), 74 (= not *Brevibolbina*; closer to *Disulcina*).
- 1976 *Brevibolbina amabilis* (Neckaja); N. Sidaravičienė, *Sovet. geol.*, **1976** (8), tab. 1 (49).
- 1976 *Brevibolbina amabilis* (Neckaja); V. Jaanusson, *The Ordovician System* (Ed. Bassett, M. G.; Proc. Palaeont. Assoc. Symp. Birmingham 1974), text-fig. 10 (faunal log).
- 1979 *Brevibolbina amabilis*; N. Sidaravičienė, *Eesti NSV Tead. Akad. Toimetised (Geol.)*, **28** (4), text-figs. 1-3 (faunal logs).

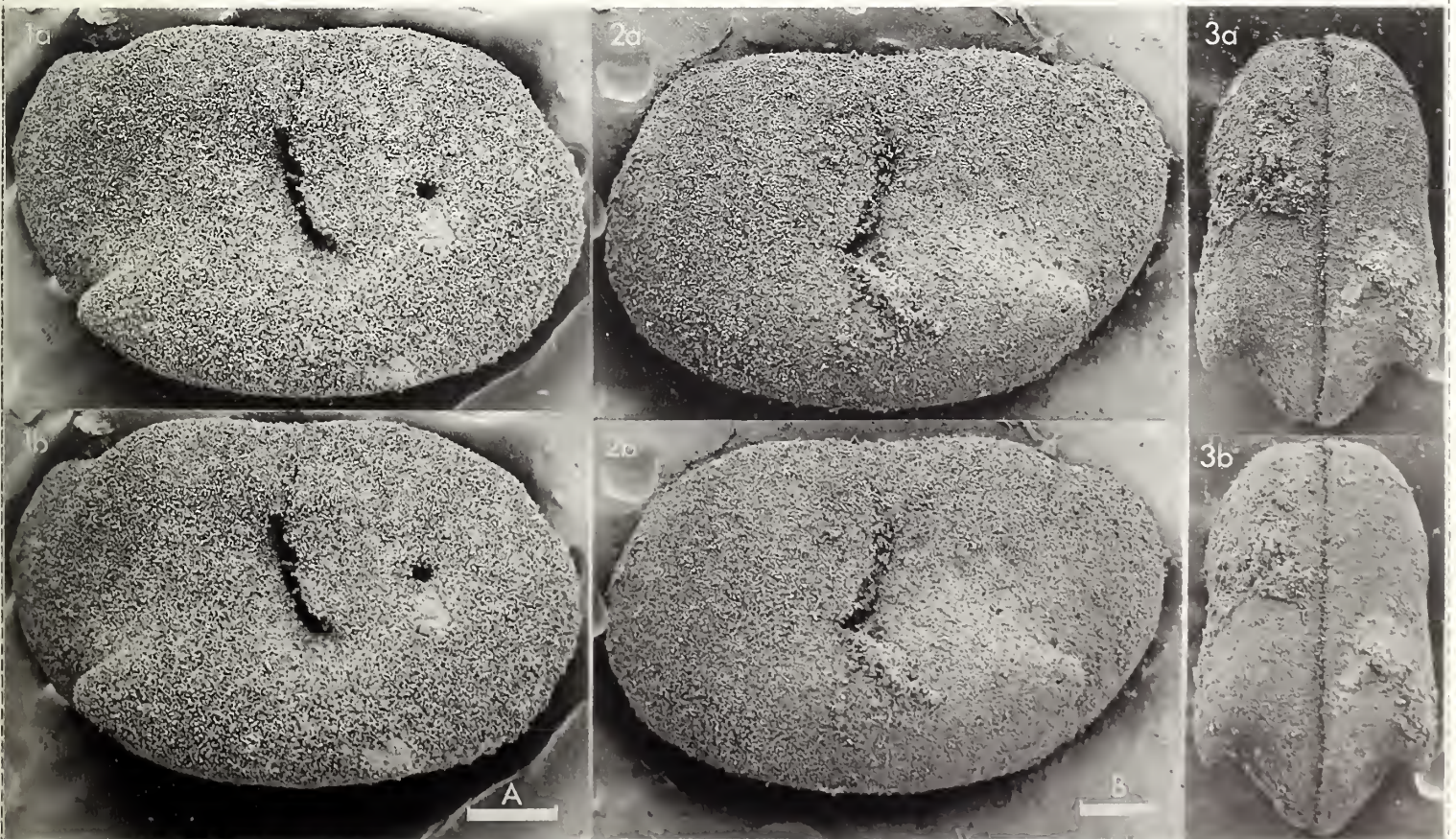
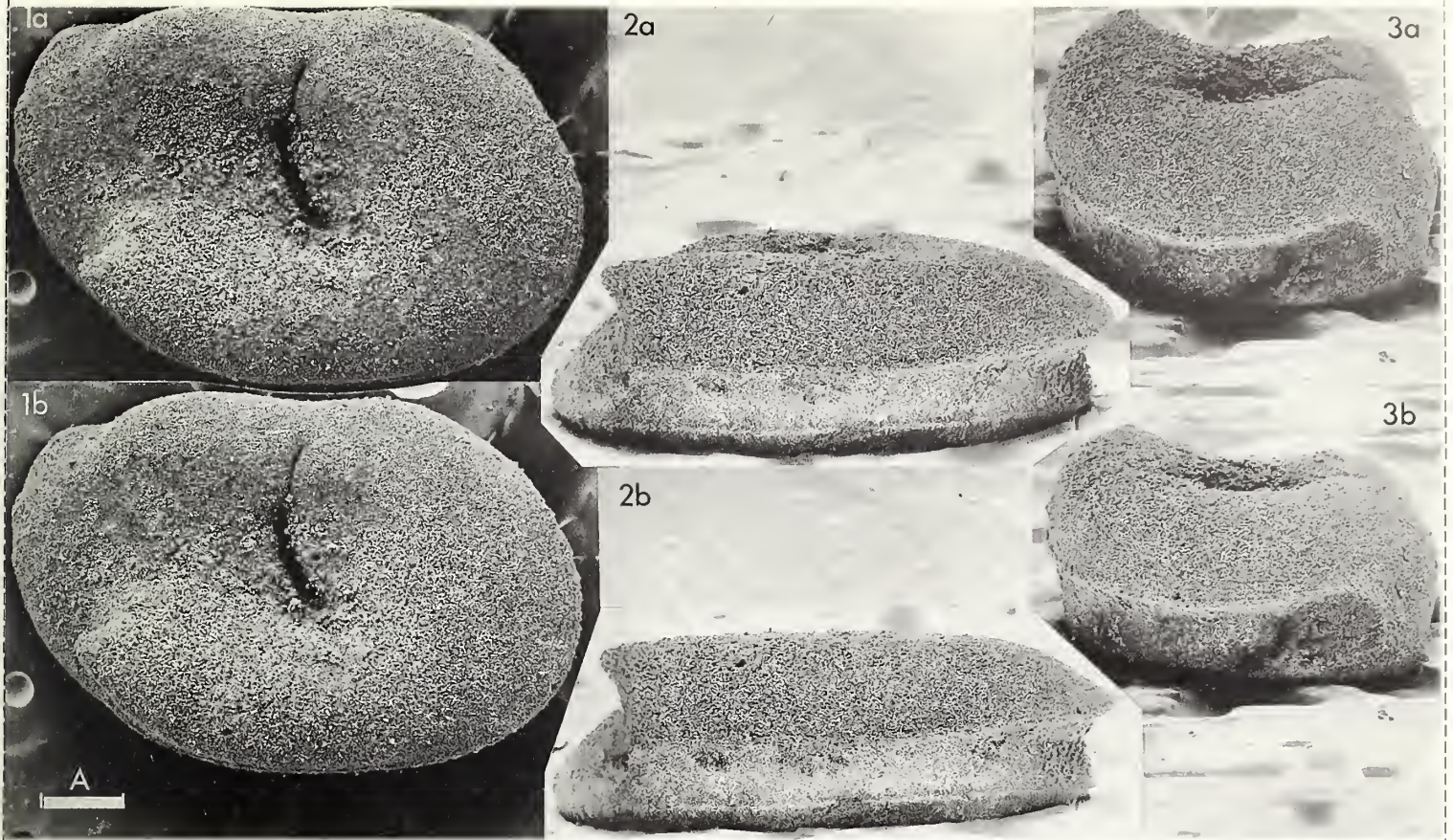
Explanation of Plate 9, 110

Figs. 1-3, ♀ RV (GPIMH 2527, 659µm long): fig. 1, ext. lat.; fig. 2, ext. vent.; fig. 3, ext. ant.
Scale A (100µm; × 120), figs. 1-3.

- Holotype:** Vsesojuznyj neftjanov naučno-issledovatel'skij geologorazvedočnyj institut (VNIGRI), Leningrad, no. 4-128, ♀ RV (carapace ?).
- Type locality:** Bol'sie Korčany, Leningrad obl., Russia; lat. 59° 33' N, long. 29° 2' E. Gubkov beds = Schundorov Substage of the Idavere Stage (C₃B), Viru Series (middle Ordovician).
- Figured specimens:** Geologisch-Paläontologisches Institut und Museum, University of Hamburg (GPIMH) nos. 2527 (♀ RV: Pl. 9, 110, figs. 1-3), 2528 (♀ RV: Pl. 9, 112, fig. 1), 2529 (♀ LV: Pl. 9, 112, fig. 2), 2530 (juv. car.: Pl. 9, 112, fig. 3), 2531 (♂ LV: Pl. 9, 114, figs. 1, 2), 2532 (juv. RV: Pl. 9, 114, fig. 3), 2533 (♀ LV: Pl. 9, 116, fig. 1), 2534 (♀ RV: Pl. 9, 116, fig. 2) and 2535 (juv. LV: Pl. 9, 116, fig. 3). All the figured specimens are from middle Ordovician Hornstein erratic boulders nos. Sy 52 (nos. 2528, 2529, 2531, 2532, 2534, 2535) and Sy 108 (nos. 2527, 2530, 2533) of the Upper Kaolinsand (Lower Pleistocene), near Braderup, Isle of Sylt (N Frisian Is., N Sea), Germany; lat. 54° 56' N, long. 8° 21' E; coll. by Ulrich von Hacht in 1978 and 1979.
- Diagnosis:** Species of *Airina* with adult females 0.64-0.77 mm long. Cavum lies in a weak sulcal depression; slit-like caval opening moderately long, has a dorsal prolongation in the form of a very narrow rudimentary slit. At dorsal border two strong plical elevations form an epicline dorsum. No connection between posterior bow of the plica and the posteroventral spine.

Explanation of Plate 9, 112

Fig. 1, ♀ RV, ext. lat. (GPIMH 2528, 644µm long); fig. 2, ♀ LV, ext. lat. (GPIMH 2529, 762µm long); fig. 3, juv. car., ext. vent. (GPIMH 2530, 537µm long).
Scale A (100µm; × 120), fig. 1; scale B (100µm; × 100), figs. 2, 3.



Remarks: Sidaravičienė (op. cit., 1976, 1979), author of the genus *Airina* (*Paleontologija i stratigrafija Pribaltiki i Belorussii* = *Palaeontology and Stratigraphy of the Baltic and the Byelorussia*, 3, 25, 1971), placed this species in *Brevibolbina*, as did Sarv (op. cit. 1959). *Brevibolbina* differs markedly, mainly by having a sulcus developed not as a cavum but as a graben, by its distinct conical pre-adductorial node and especially by its "false brood pouch" with its strongly convex dolonate botulus (Schallreuter, *Stereo-Atlas Ostracod Shells*, 6, 72; 6, 74, 1979). *Airina* possesses a typical admarginal botulate antrum. In the original description of *Airina* type-species *Hallatia cornuta* Neckaja (in Abushik et al., *Trudy VNIGRI*, 115 = *Mikrofauna SSSR*, 9, 247, 1958), no cavum is mentioned. The holotype (op. cit., pl. 2, fig. 7) only exhibits a weak sulcus. I suppose that the caval slit is hidden by material so that only the sulcal depression (also present in *A. amabilis*) is seen. If this is not the case and *Airina cornuta* does not possess a cavum, *A. amabilis* would belong to a new genus. *Airina adducta* Sidaravičienė, 1971 (op. cit., 25-26, pl. 1, fig. 1) shows a distinct caval slit. In this respect and in its antral morphology (cf. Sidaravičienė 1971, fig. 1b and Pl. 9, 110, fig. 2) this species is very similar to *A. amabilis*. *A. adducta* differs from *A. amabilis* mainly by its larger size (1.00 mm long), its missing (or weak ?) dorsal plica and its (presumably cristal) keel between the dorsal border and its posteroventral spine.

Airina mezciemensis Gailite (*Fauna i stratigrafija paleozoja i mesozoja Pribaltiki i Belorussii* = *The Fauna and Stratigraphy of Paleozoic and Mesozoic of Baltic and Byelorussia*, 49-50, pl. 1, figs. 6a-b, 1975) is larger (♀♀: 0.90-1.10 mm) than *A. amabilis*, possesses a shorter caval slit and lacks plical elevations. A keel similar to that in *A. adducta* is present posterocentrally and posteroventrally in *A. mezciemensis*, forming a spine-like projection which distinctly overlaps the free margin in lateral view. In *A. adducta* this projection does not reach over the free margin and in *A. cornuta* it only slightly overlaps the free margin.

Explanation of Plate 9, 114

Figs. 1, 2, incomplete ♂ LV (GPIMH 2531, 640 μm long): fig. 1, ext. lat.; fig. 2, ext. vent. Fig. 3, juv. RV, ext. lat. (GPIMH 2532, 590 μm long).

Scale A (100 μm; × 130), figs. 1, 2; scale B (100 μm; × 90), fig. 3.

Remarks (contd.): *A. amabilis* (Kukruse-Kerla stages; C₂-D₂), *A. adducta* (Oanda-Rakvere stages D₃-E), *A. cornuta* (F₁) and *A. mezciemensis* (Pirgu Stage, F_{1c}) form a phylogenetic lineage. In *A. amabilis* a strong dorsal plica and separate posteroventral spine is present. In *A. adducta* the plica is lacking and there is a keel-like connection between the posterior plical bow and the posteroventral spine. In *A. adducta* the keel reaches the dorsal border and the posteroventral spine does not overlap the free margin (Sidaravičienė, op. cit., pl. 1, fig. 1a, 1971). In *A. cornuta* the keel also reaches the dorsal border and the posteroventral spine slightly overlaps the free margin (Abushik et al., op. cit., pl. 2, fig. 7a). In *A. mezciemensis* the keel is present only in the posterocentral and posteroventral regions and the posteroventral spine distinctly overlaps the free margin in lateral view (Gailite, op. cit., pl. 1, fig. 6a).

Sarv (op. cit., 142, 1959) considered *Ctenobolbina* ? aff. *obliqua* of Öpik (*Tartu ülikooli j.o. loodusuurijate seltsi aruanded* = *Ann. soc. rebus naturae invest. Univ. Tartu constitutae*, 43 (1/2) 100; respectively *Tartu ülikooli geol.-inst. toimetused* = *Publ. geol. Inst. Univ. Tartu*, 50, 36, 1937) conspecific with *Brevibolbina amabilis*. This seems not to be the case because of the sigmoidal sulcus, missing dorsal elevations and other distinguishing features of '*C. obliqua*'.

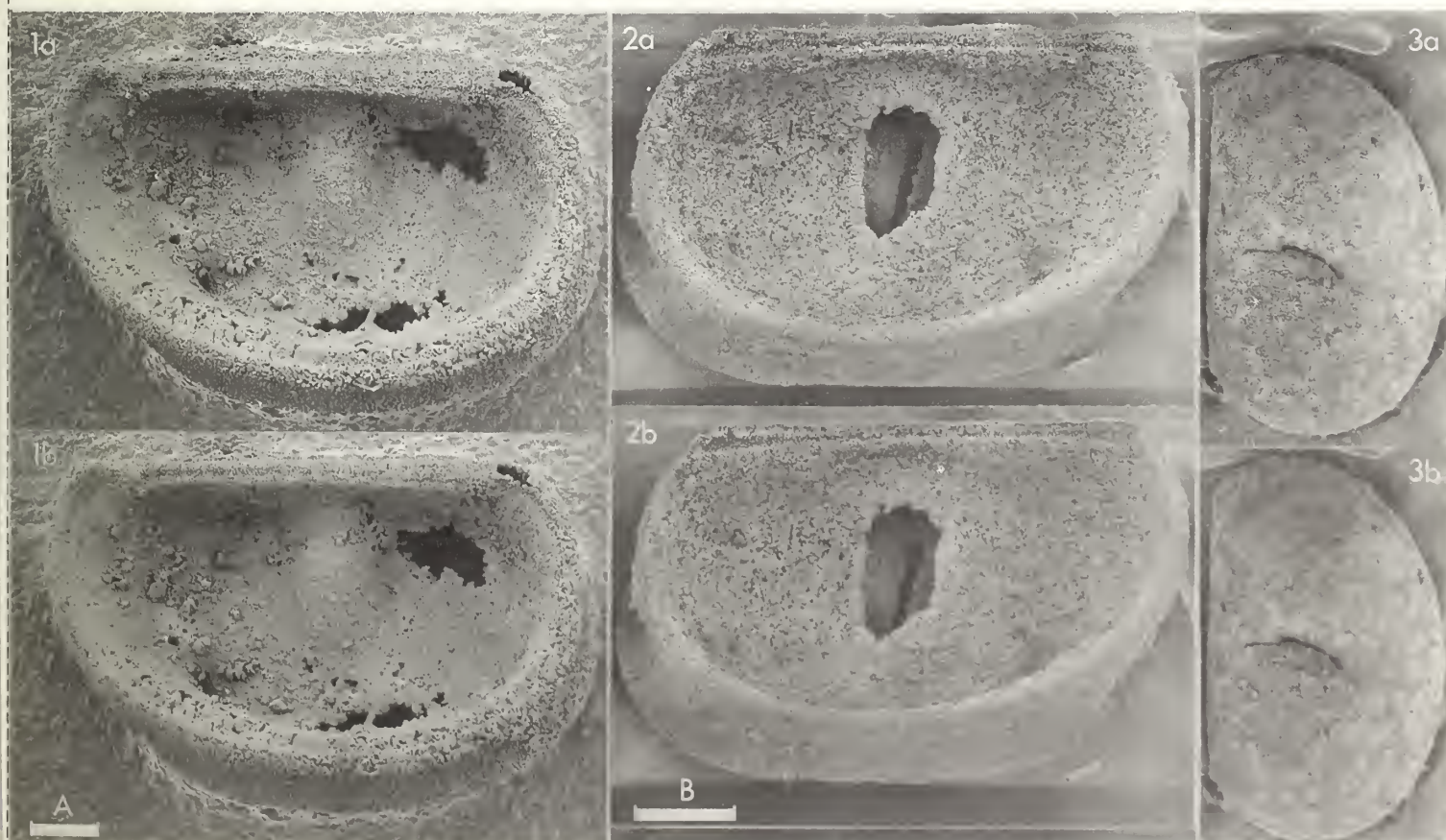
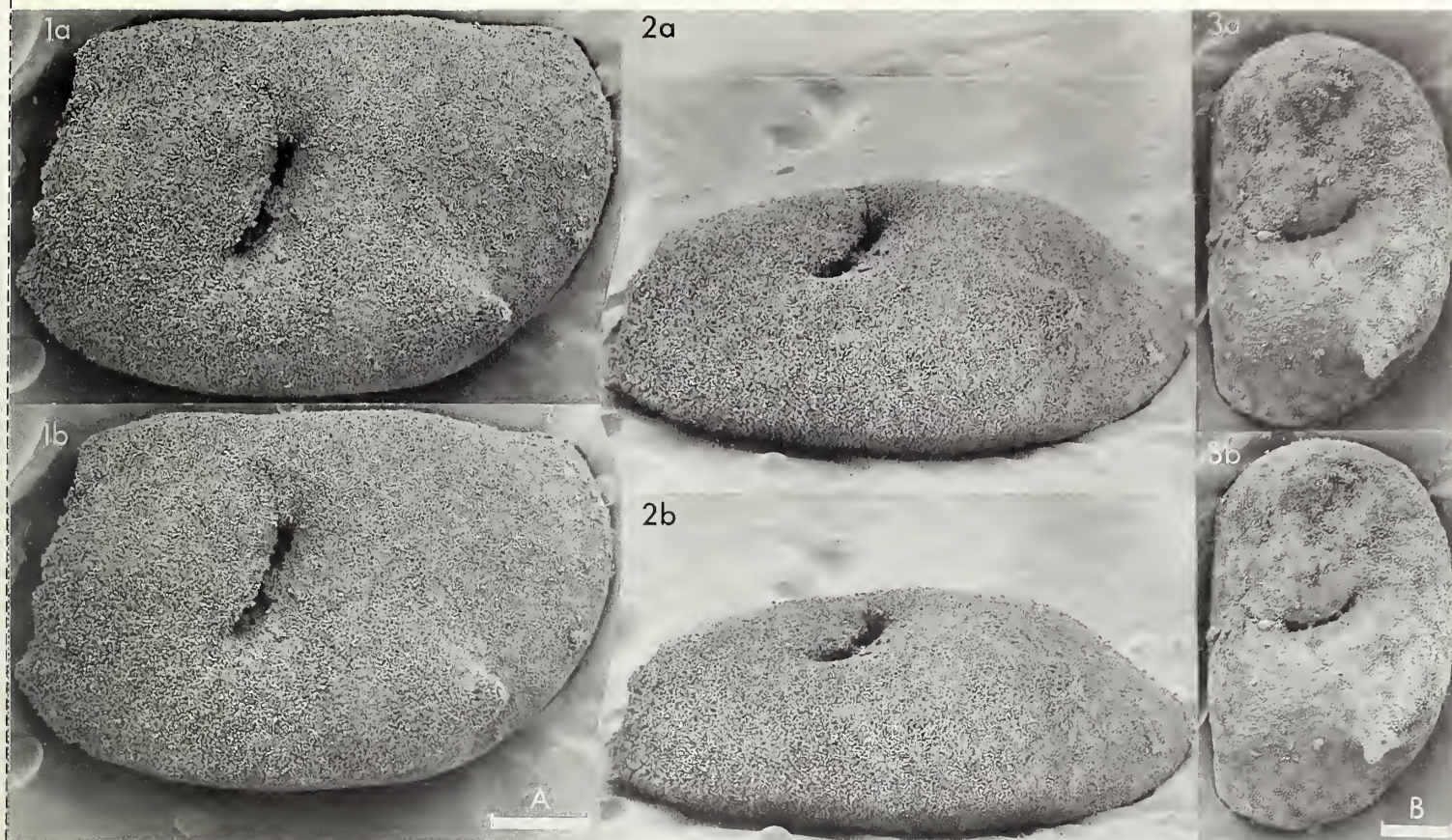
A. amabilis is another good example of the sulcal sculpture called (Schallreuter, *Ber. geol. Ges. DDR*, 9 (3), 390-391, 1964; 10 (4), 482-483, 1965) a cavum. A cavum consists of a relatively large inner 'bubble' of shell material which has only a small slit-like external opening. The function of the cavum is unknown; perhaps it was some kind of buoyancy organ.

Distribution: NW Russian Platform (Leningrad, Estonia, Lithuania): Kukruse (C₂)-Keila stages (D₂), upper part of Viru Series (middle Ordovician). Lower upper part of Viru Series in Hornstein erratic boulders of the Upper Kaolinsand (Lower Pleistocene) near Braderup, Isle of Sylt (N Frisian Is., N Sea), Germany.

Explanation of Plate 9, 116

Fig. 1, ♀ LV, int. lat. (GPIMH 2533, 710 μm long); fig. 2, ♀ RV, int. lat. (GPIMH 2534, 638 μm long); fig. 3, juv. LV, ext. lat. (GPIMH 2535, 506 μm long).

Scale A (100 μm; × 105), figs. 1, 3; scale B (100 μm; × 125), fig. 2.



ON *BENNELONGIA TUNTA* DE DECKKER sp. nov.

by Patrick De Deckker
(Australian National University, Canberra)

Bennelongia tunta sp. nov.

1981 *Bennelongia* sp. De Deckker, *Trans. R. Soc. S. Aust.*, **105**, 95, fig. 8r.

Holotype: Australian Museum, Sydney, dissected ♂, **P32574**.

Type locality: Billabong (20° 12' 23" S, 145° 58' 41" E) at the northern end of Lake Powlathanga, very close to Powlathanga Homestead, 35 km W of Charters Towers, Queensland, Australia. Material collected by P. De Deckker (4.VI.1981).

Derivation of name: From an Aboriginal language of Queensland meaning spear in reference to the numerous denticles along a great part of the periphery of the left valve.

Figured specimens: Australian Museum, Sydney nos. **P32574** (holotype ♂ car.; LV: Pl. 9, 124, figs. 1-2; RV: Pl. 9, 124, fig. 3; Text-fig. 1 B-E; Text-fig. 2A, C-H), **P32575** (♂ LV: Pl. 9, 118, fig. 3), **P32576** (♀ car.; LV: Pl. 9, 120, fig. 1; RV: Pl. 9, 120, fig. 2; Text-fig. 2E), **P32577** (♀ RV: Pl. 9, 118, fig. 2, Text-fig. 1A, F), **P32578** (♂ car.: Pl. 9, 120, fig. 3), **P32579** (♀ car.: Pl. 9, 122, fig. 2), **P32580** (♀ car.: Pl. 9, 118, fig. 1; Pl. 9, 122, fig. 4), **P32581** (juv. car.: Pl. 9, 122, fig. 1); **P32582** (juv. car.: Pl. 9, 122, fig. 6), **P32583** juv. (RV: Pl. 9, 122, fig. 3; LV: Pl. 9, 122, fig. 5). All from type locality.

Diagnosis: Oblong shell with LV the larger and forming a dorsal "keel" which embraces the shorter and more ellipsoidal RV; periphery of LV denticulated antero- and posterodorsally and of RV ventrally.

Explanation of Plate 9, 118

Fig. 1, ♀ car., ext. rt. lat. (**P32580**, 2200 µm long); Fig. 2, ♀ RV, ext. lat. (**P32577**, 1965 µm long); fig. 3, ♂ LV, ext. lat. (**P32575**, 2160 µm long). All paratypes.

Scale A (1000 µm; × 28), figs. 1-3.

Diagnosis (contd): Valves asymmetrical especially anteroventrally where the larger LV is beak-shaped with broad concave depression posterior to the beak; RV almost smoothly curved except for narrow and pointed beak-shaped structure at edge. Lateral lobe and distal end of inner lobe of hemipenis both pointed and curved inward.

Remarks: *B. tunta* can swim actively and has a green shell. The small, smooth and narrow claw fixed on the inner side of the last segment of the male antenna (Text-fig. 1D) is longer, broader and denticulated in females. Other species of *Bennelongia*, which like *B. tunta* are characterized by a conspicuous inner list forming a lip-like flap anteroventrally only in the LV, have been recently described or reviewed in De Deckker (*Trans. R. Soc. S. Aust.*, **105**, 91-138, 1981) and De Deckker and McKenzie (*ibid* **105**, 53-58, 1981). *B. tunta* is easily distinguished from other species of the genus by the following features: rectangular outline of the shell, much narrower shape in dorsal view, prominent dorsal "keel" seen on taller LV; lateral lobe of hemipenis in shape of a bird of prey's beak. The ventral area of both valves is characterized by a number of small pustules which are closely arranged in rows; these are best seen near the mouth region. Arrangement of adductor muscle scars (see Pl. 9, 120, fig. 1) like that of *B. harpago* as illustrated on Fig. 7 in De Deckker and McKenzie (*op. cit.*) except that the central scar in the posterior row is missing in *B. tunta*.

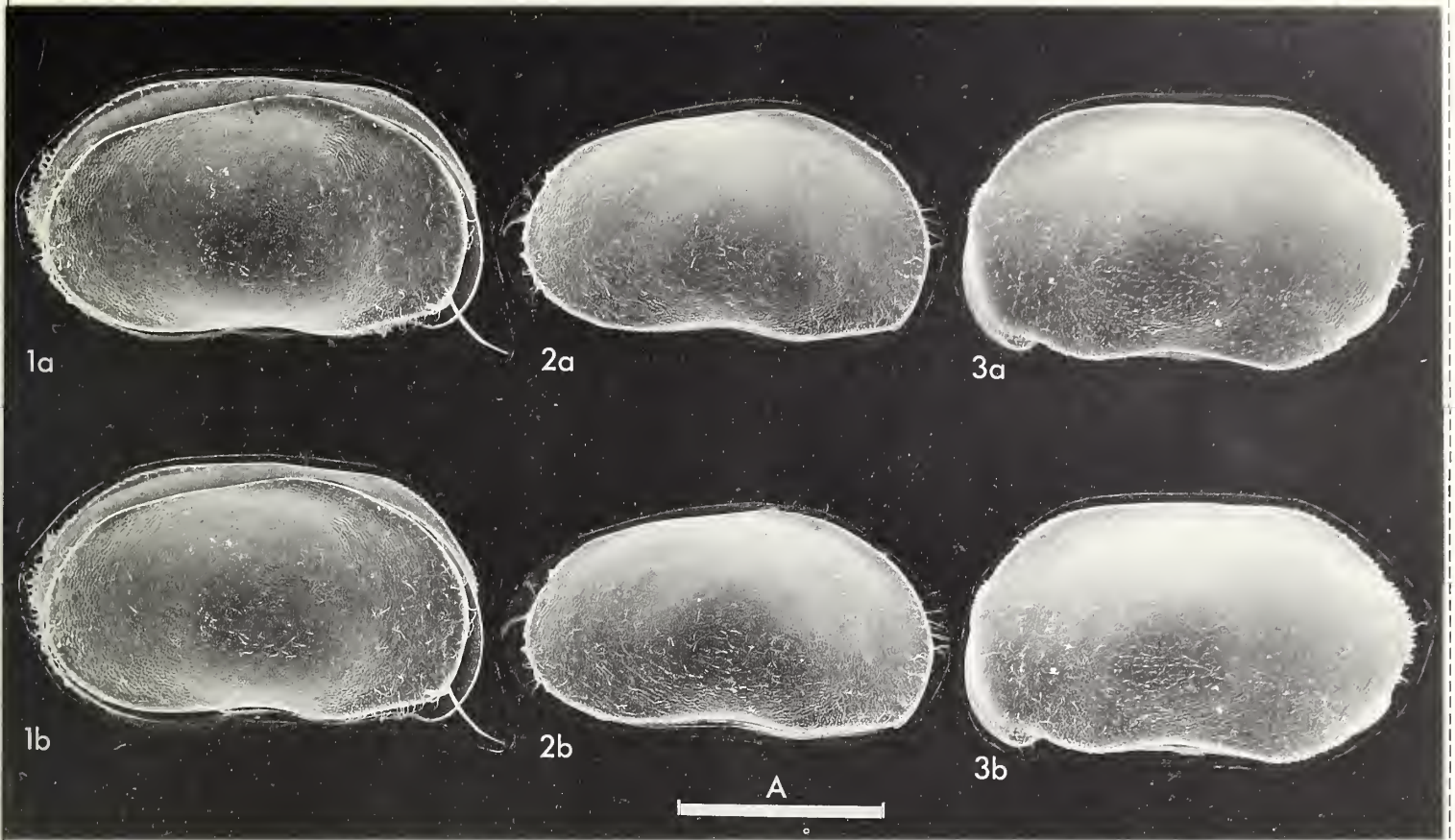
Undissected paratype material of *B. tunta* is deposited at the Australian Museum under no. **P32584**.

Distribution: *B. tunta* was originally recorded from Cauckingburra Swamp (collected by Dr B. V. Timms, 16.VII.1974, see De Deckker, 1981 *op. cit.*) near Lake Buchanan, SW. of Charters Towers in Queensland. It was re-collected on 3.VI.1981 by P.D.D. It also has been found some 400 km S. of Charters Towers in 3 adjacent roadside swamps on the northern side of the road between Alice and Barcaldine (20 km E. of Barcaldine and 2 km E. of Geera Railway Station) on 30.V.1981 by P.D.D. The type locality is on the W. of Charters Towers.

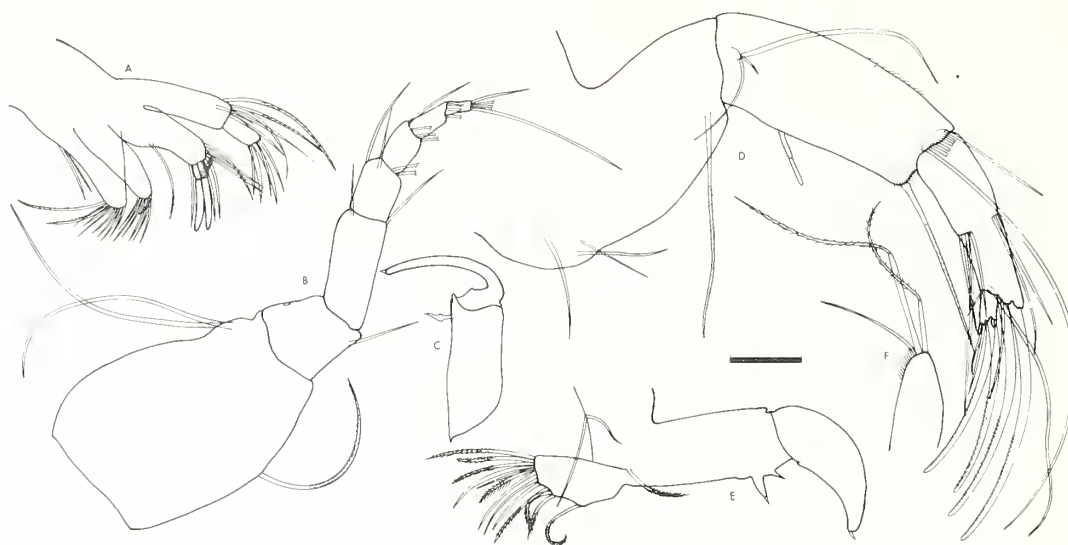
Explanation of Plate 9, 120

Fig. 1, ♀ LV, int. lat. (**P32576**, 2340 µm long); fig. 2, ♀ RV, int. lat. (**P32576**, 2060 µm long); fig. 3, ♂ car., ext. lt. lat. (**P32578**, 2025 µm long). All paratypes.

Scale A (1000 µm; × 28), figs. 1-3.



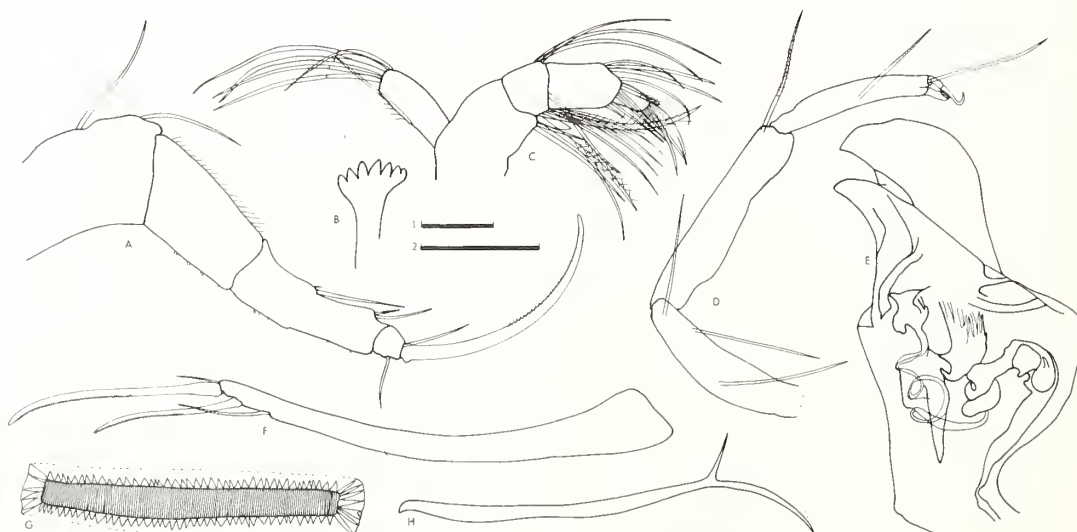
Text-fig. 1, ♀ (paratype, **P32577**) A: maxillular processes and palp; F: maxillar palp. ♂ (holotype, **P32574**) B: antennula, C: left maxillar palp; D: antenna; E: right maxilla.



Explanation of Plate 9, 122

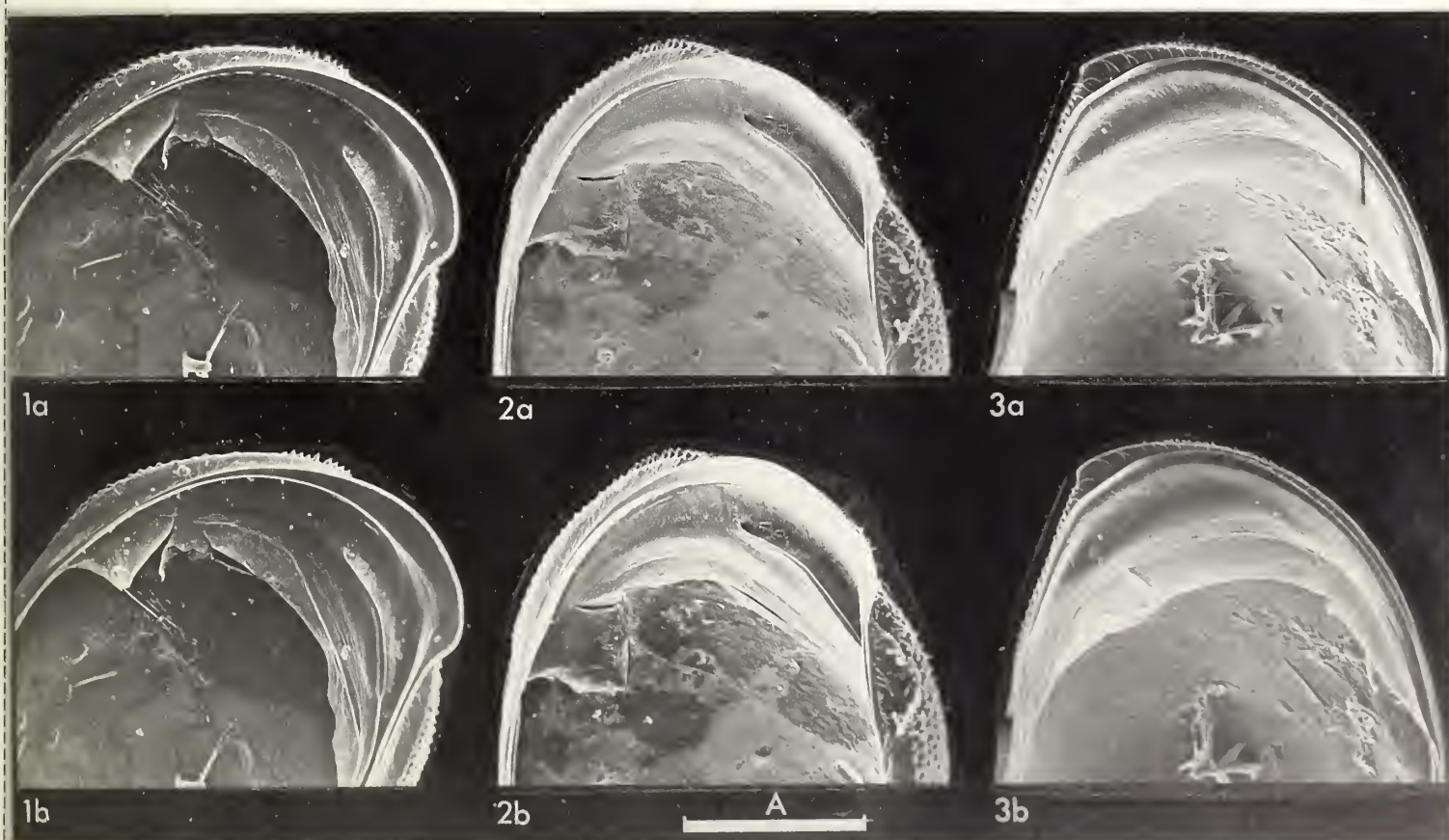
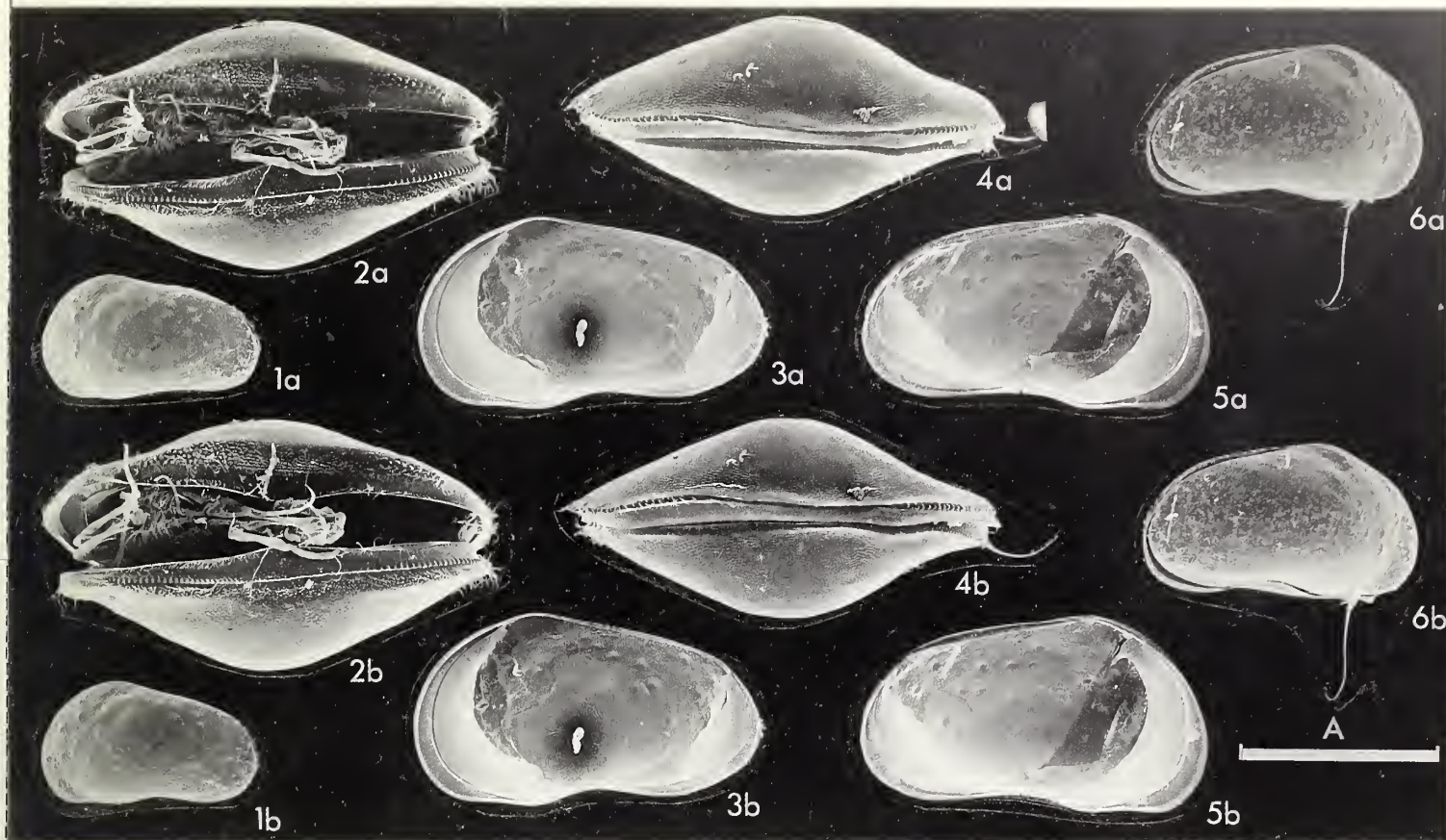
Fig. 1, juv. car., ext. lt. lat. (**P32581**, 1050 μ m long); fig. 2, ♀ car., ext. vent. (**P32579**, 2170 μ m long); fig. 3, juv. RV, int. lat. (**P32583**, 1680 μ m long); fig. 4, juv. car., ext. dors. (**P32580**, 2200 μ m long); fig. 5, juv. LV, int. lat. (**P32583**, 1680 μ m long); fig. 6, juv. car., ext. rt. lat. (**P32582**, 1335 μ m long). All paratypes. Scale A (1000 μ m; $\times 28$), figs. 1-6.

Text-fig. 2, ♂ (holotype, **P32574**) A: thoracopoda I; C: mandibular palp; D: thoracopoda II; E: hemipenis; F: furca; G: Zenker organ; H: furcal attachment. ♀ (paratype, **P32576**) B: rake-like organ. Scale 1: 100 μ m for A, C-H; 2: 100 μ m for B.



Explanation of Plate 9, 124

Figs. 1-3, car. (holotype, **P32574**), figs. 1, 2, LV, ant. int. lat. at different angles; fig. 3, RV, ant. int. lat. Scale A (500 μ m; $\times 55$), figs. 1-3.



ON *CABONCYPRIS NUNKERI* DE DECKKER gen. et sp. nov.

by Patrick De Deckker
(Australian National University, Canberra)

Genus *Caboncypris* gen. nov.

Type species: *Caboncypris nunkeri* sp. nov.

- Derivation of name:** From an Aboriginal language of Western Australia meaning large, combined with *Cypris*.
Diagnosis: Large size (~ 3 mm long), smooth to pseudopunctate shell with broad selvage in both valves and placed far away from outer edge. Ventral overlap of LV over RV. "Sensory" organ on side of 2nd segment of antenna like a tiny depression; distal segment of maxillula elongated; mandibular palp with α bristle smooth and as long as penultimate segment, β bristle shorter and tufted, γ bristle slightly longer than distal segment and pilose on its distal half; rake-like organ with 6 to 7 teeth plus a bifid one; male maxillar palps asymmetrical; penultimate segment of thoracopoda I weakly divided; furca with 2 claws and 2 smaller setae; furcal attachment simple and bifurcate; Zenker's organ with more than 60 rosettes.
Remarks: The morphology of the furca (2 claws, 2 setae) and of the furcal attachment (proximal part bifurcate and median part simple) places *Caboncypris* in the Eucypridinae Bronstein, 1947.
Caboncypris nunkeri sp. nov.
Holotype: Australian Museum, Sydney, dissected ♂ **P32563**
Type locality: Roadside swamp, on edge of Armidale golf course along Forrest road situated E. of Forrestdale Lake, near Perth, Western Australia. Material collected by J. Terni (8.IX.1981).
Derivation of name: From an Aboriginal language of Western Australia meaning pretty.

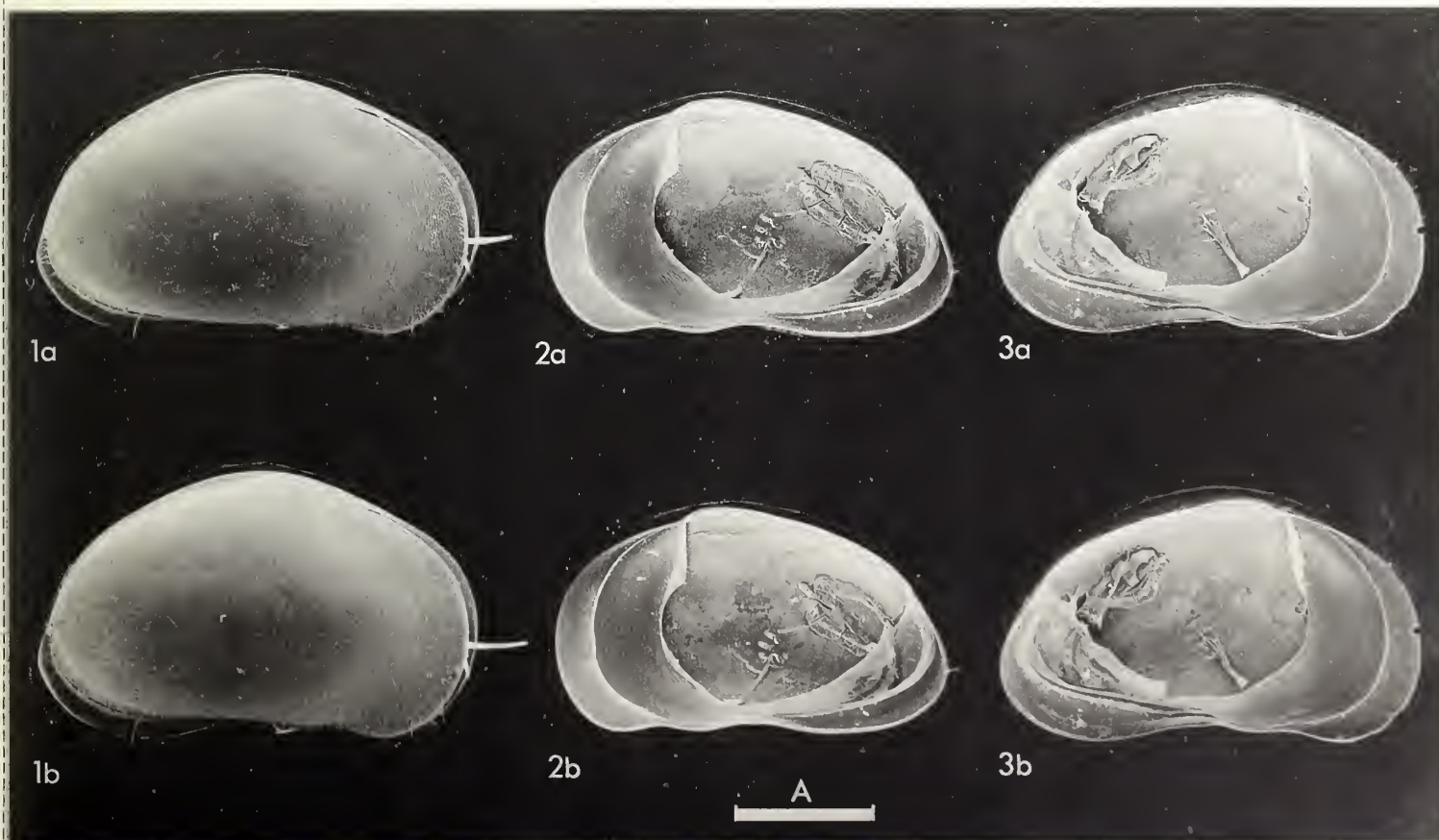
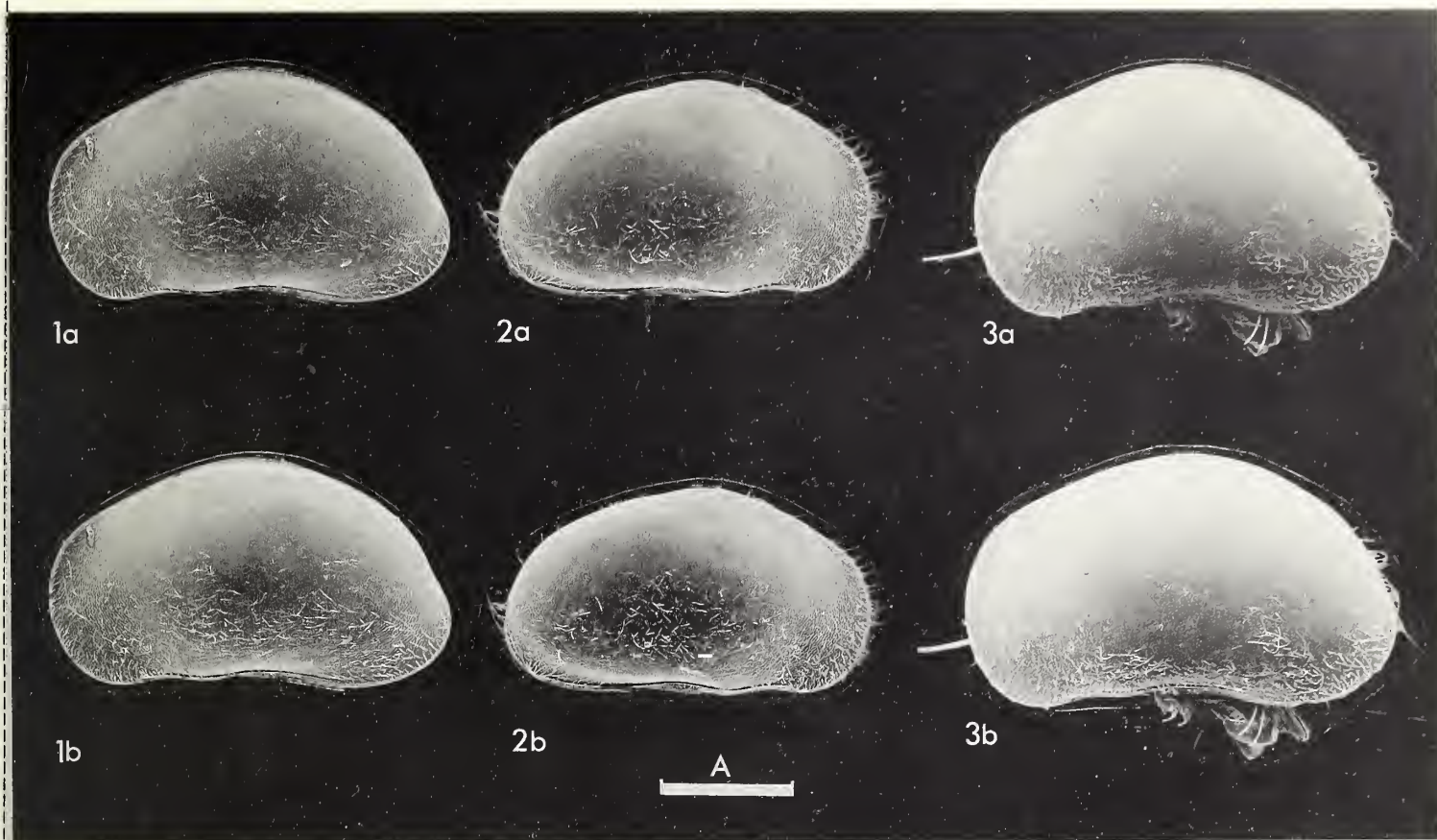
Explanation of Plate 9, 126

Fig. 1, ♂ LV, ext. lat. (**P32564**, 2950 μ m long); fig. 2, ♂ RV, ext. lat. (**P32564**, 2740 μ m long); fig. 3, ♂ car., ext. lt. lat. (**P32567**, 2960 μ m long). All paratypes.
Scale A (1000 μ m; \times 20), figs. 1-3.

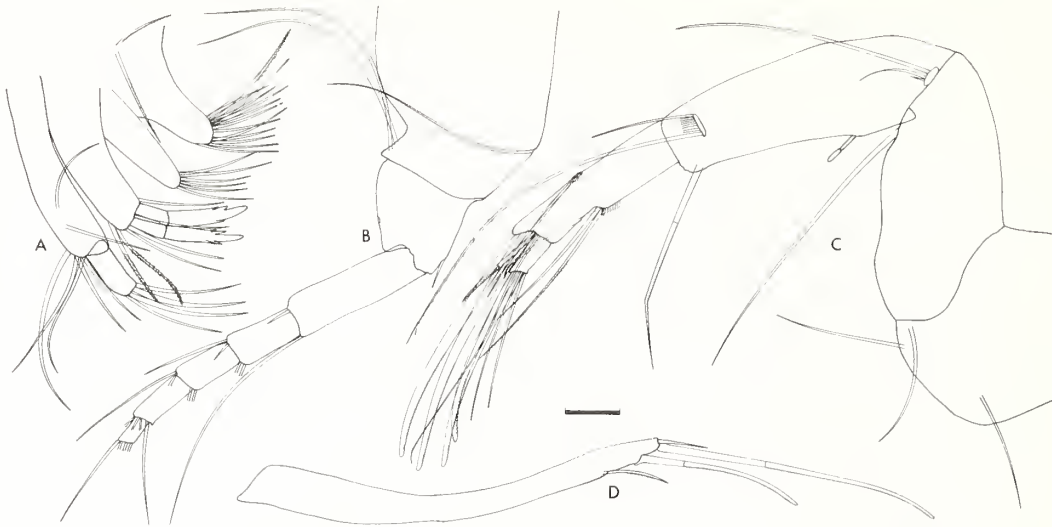
- Figured specimens:** Australian Museum, Sydney, Nos. **P32563** (holotype, ♂ RV: Pl. 9, 128, fig. 2; LV: Pl. 9, 128, fig. 3; rake-like organs: Pl. 9, 132, fig. 3; Text-fig. 1; Text-fig. 2A-I), **P32564** (♂ car.; LV: Pl. 9, 126, fig. 1; RV: Pl. 9, 126, fig. 2; Zenker's organ: Pl. 9, 132, fig. 2; hemipenis: Pl. 9, 132, fig. 4), **P32565** (♀ maxillular palp: Text-fig. 2E); **P32567** (♂ car.: Pl. 9, 126, fig. 3); **P32568** (♂ car.: Pl. 9, 130, fig. 1), **P32569** (♀ car.: Pl. 9, 128, fig. 1; Pl. 9, 130, fig. 3), **P32570** (♂ anatomy: Pl. 9, 130, fig. 2); **P32571** (♂ anatomy: Pl. 9, 130, fig. 4), **P33572** (♂ anatomy: Pl. 9, 132, fig. 1). All from type locality.
Diagnosis: Ellipsoid shell in lateral view with flattened ventral area where two concavities occur, one at $\frac{1}{4}$ of length from anterior end and other in middle. LV larger and overlapping RV in dorsal area by forming a narrow "keel". Selvage prominent throughout and similar in both valves being well removed from outer edge except in mouth region where it is near outer edge at level of anterior concavity. Posteriorly, selvages in both valves interlock with RV selvage external. Maxillular palps of male asymmetrical with inner edge of right grasping organ bearing a lump. Lateral lobe of hemipenis digitate and curved inward; inner lobe broad and tongue-shaped. Furcal claws unequal.
Remarks: *Caboncypris* differs from the Australian endemic genus *Australocypris*, which it closely resembles, by the position of the selvage in both valves which is an important taxonomic feature at generic level in the tribe Mytilocypridini (see De Deckker, *Aust. J. Zool. Suppl. Ser.* **58**, 1-62, 1978), to which *Caboncypris* belongs. *Caboncypris* differs from the megalocypridine genera by having a narrow digitate outer lobe on the hemipenis (in *Megalocypris* it is trapezoid, *Apateleocypris* tongue-like and *Hypseleocypris* circular shaped); also, the furcal attachment in all these 3 genera has a hook-like process near the articular extremity whereas none is present in *Caboncypris*.
Distribution: *C. nunkeri* has been collected at the type locality on several occasions by J. Terni to whom I am most grateful. It has also been collected once before in 1905 by the Hamburg Scientific Expedition to Western Australia. I wish to thank Prof. G. Hartmann for supplying material from this collection.

Explanation of Plate 9, 128

Fig. 1, ♂ car., ext. rt. lat. (paratype, **P32569**, 3125 μ m long); fig. 2, ♂ RV, int. lat. (holotype, **P32563**, 2900 μ m long); fig. 3, ♂ LV, int. lat. (holotype, **P32563**, 3030 μ m long).
Scale A (1000 μ m; \times 20), figs. 1-3.



Text-fig. 1, ♂ (holotype, **P32563**) A: maxillular processes and palp; B: antennula; C: antenna; D: furca.

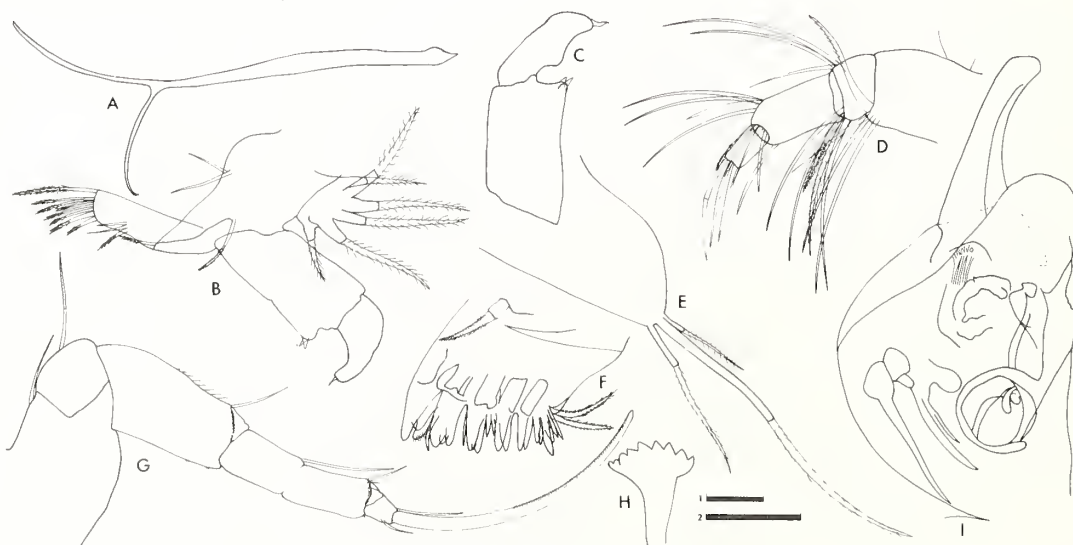


Explanation of Plate 9, 130

Fig. 1, ♂ car., ext. vent. (**P32568**, 2910 μm long); fig. 2, ♂, rt. lat., anatomy and part of LV visible after RV removed (**P32570**, 3200 μm long); fig. 3, ♀ car., ext. dors. (**P32569**, 3060 μm long); fig. 4, ♂, lt. lat. tilted, anatomy and part of RV visible after LV removed (**P32571**, 2600 μm long). All paratypes.

Scale A (1000 μm ; $\times 20$), figs. 1, 3; B (1000 μm ; $\times 17.5$), fig. 2; C (1000 μm ; $\times 25$), fig. 4.

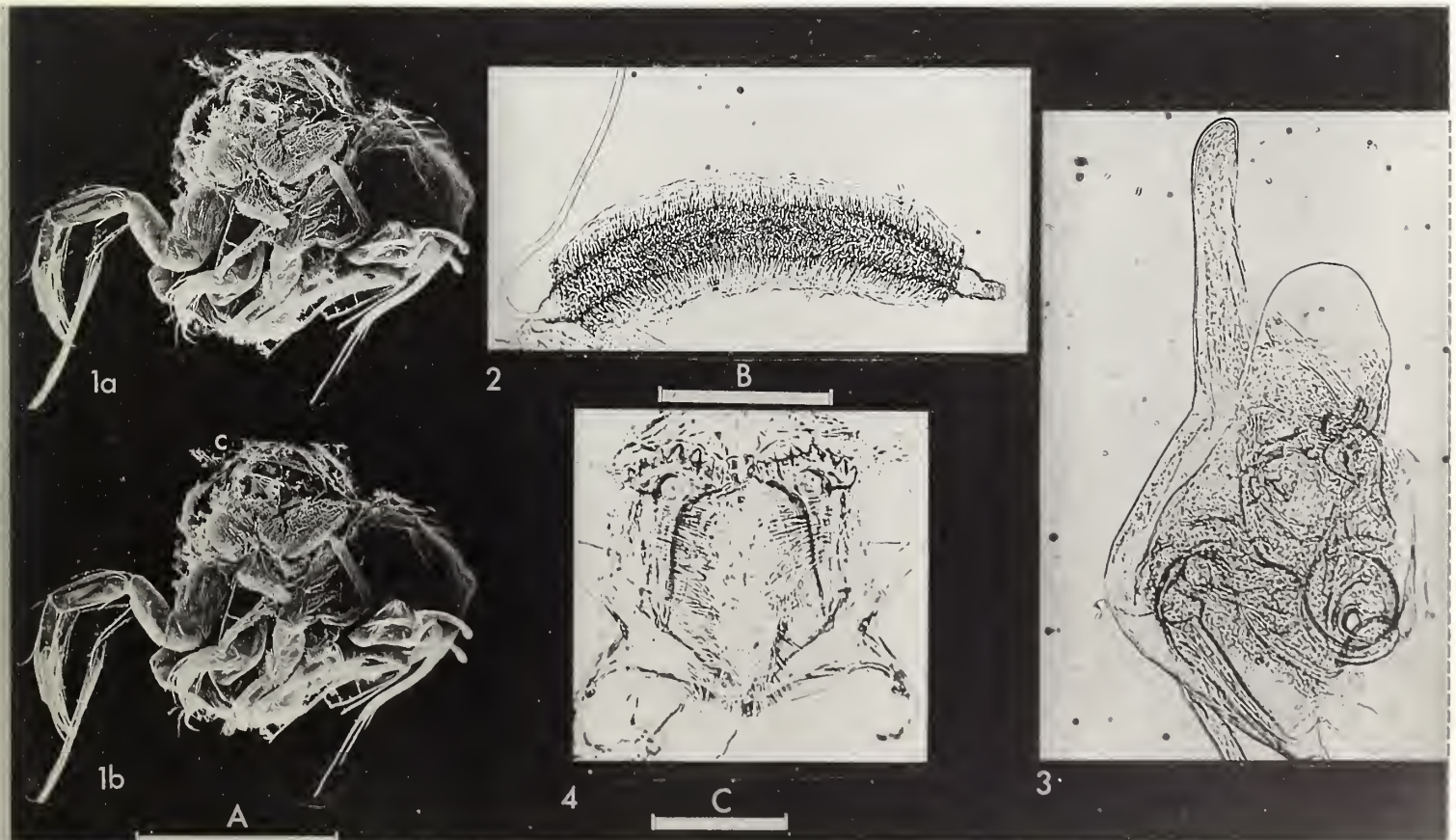
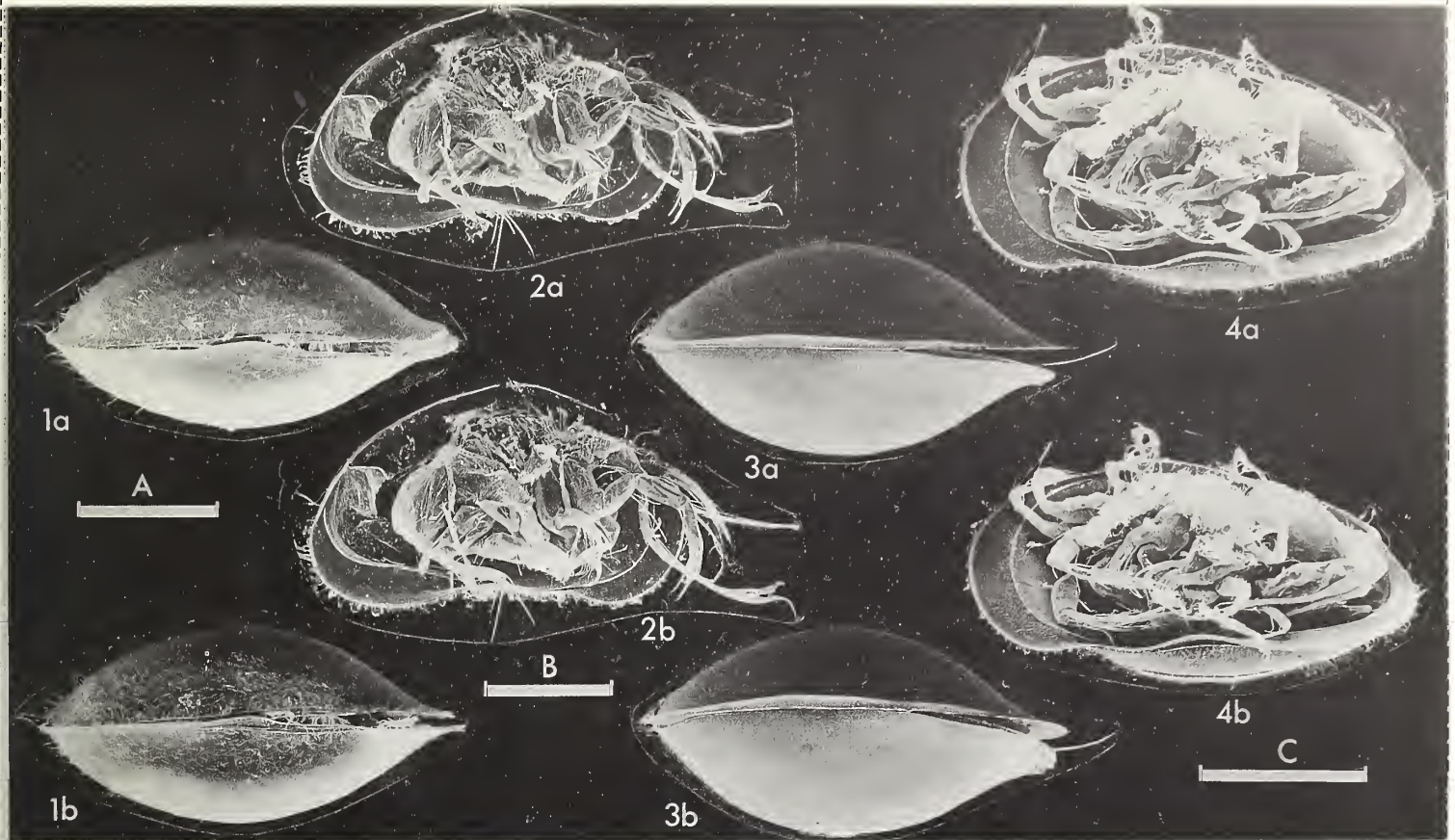
Text-fig. 2, ♂ (holotype, **P32563**) A: furcal attachment; B: left maxilla; C: right maxillar palp; D: mandibular palp; F: mandibular coxale; G: thoracopoda I; H: rake-like organ; I: hemipenis. ♀ (paratype, **P32565**) E: maxillular palp. Scale 1: 100 μm for A-D, F-G, I; 2: 100 μm for E, H.



Explanation of Plate 9, 132

Fig. 1, ♂, lt. lat., anatomy after both valves removed (paratype, **P32572**, 2225 μm long); fig. 2, ♂, Zenker organ (paratype, **P32564**, 560 μm long); fig. 3, ♂, hemipenis (paratype, **P32564**, 560 μm long); fig. 3, o, rake-like organs (holotype, **P32563**); fig. 4, ♂, hemipenis (paratype, **P32564**, 760 μm long).

Scale A (1000 μm , $\times 28$), fig. 1; B (200 μm ; $\times 115$), figs. 2, 4; C (100 μm ; $\times 185$), fig. 3.



ON *CYPRETTA YAPINGA* DE DECKKER sp. nov.

by Patrick De Deckker
(Australian National University, Canberra)

Cypretta yapinga sp. nov.

Holotype: Australian Museum, Sydney, dissected ♂, **P32557**.

Type Locality: Mudginberri Lagoon, a billabong along Magela Creek (lat. 12° 36' S, long. 132° 52' E), some 200 km E of Darwin, Northern Territory, Australia. Material collected by Dr. R. Marchant (17.1.1980).

Derivation of name: From an Aboriginal language of the Northern Territory, meaning big.

Figured specimens: Australian Museum, Sydney nos. **P32556** (♂ car.; LV: Pl. 9, 136, fig. 2; RV: Pl. 9, 136, fig. 3; Pl. 9, 140, fig. 1; Zenker's organ: Pl. 9, 140, fig. 3; Text-fig. 1; Text-figs. 2 C-H), **P32557** (holotype ♂ car.; LV: Pl. 9, 134, fig. 1; RV: Pl. 9, 134, fig. 3; hemipenis: Pl. 9, 140, fig. 2; Zenker's organ: Pl. 9, 140, fig. 5), **P32558** (♀ LV: Pl. 9, 134, fig. 2; Text-figs. 2A-B), **P32559** (♀ LV: Pl. 9, 136, fig. 1), **P32560** (♂ car.: Pl. 9, 138, fig. 1; Pl. 9, 140, fig. 4), **P32561** (♂ car.: Pl. 9, 138, fig. 3), **P32562** (♀ car.: Pl. 9, 138, fig. 2). All from type locality.

Explanation of Plate 9, 134

Fig. 1, ♂ LV, ext. lat. (holotype, **P32557**, 900 µm long); fig. 2, ♀ LV, ext. lat. (paratype, **P32558**, 1010 µm long); fig. 3, ♂ RV, ext. lat. (holotype, **P32557**, 975 µm long).
Scale A (500 µm; × 58), figs. 1-3.

Diagnosis: Shell triangular in lateral view with length-height ratio between 1.4 and 1.5; greatest height at about middle. Dorsal area, where left valve is embraced by right and at the point of greatest height, forming a conspicuous pointed boss. In front of the boss, shell broadly curved but behind it is steeply inclined. Selvage in same position in both valves but much broader in right valve. Furca without anterior seta or with a miniscule one. Lateral lobe of hemipenis tongue-shaped and outer lobe small and wedge-shaped. For outline see Text-fig. 2F. Zenker's organ with about 17 rosettes.

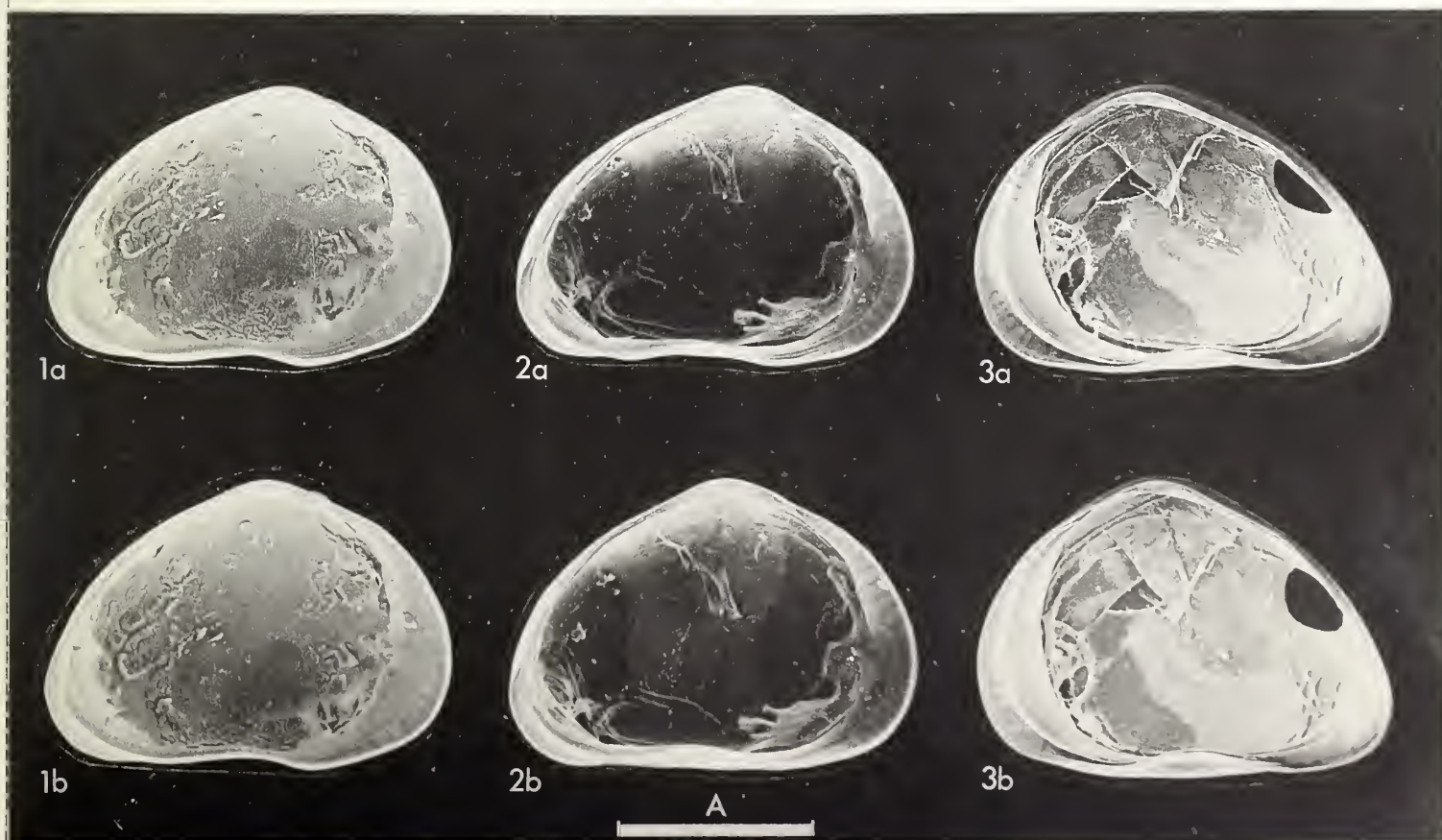
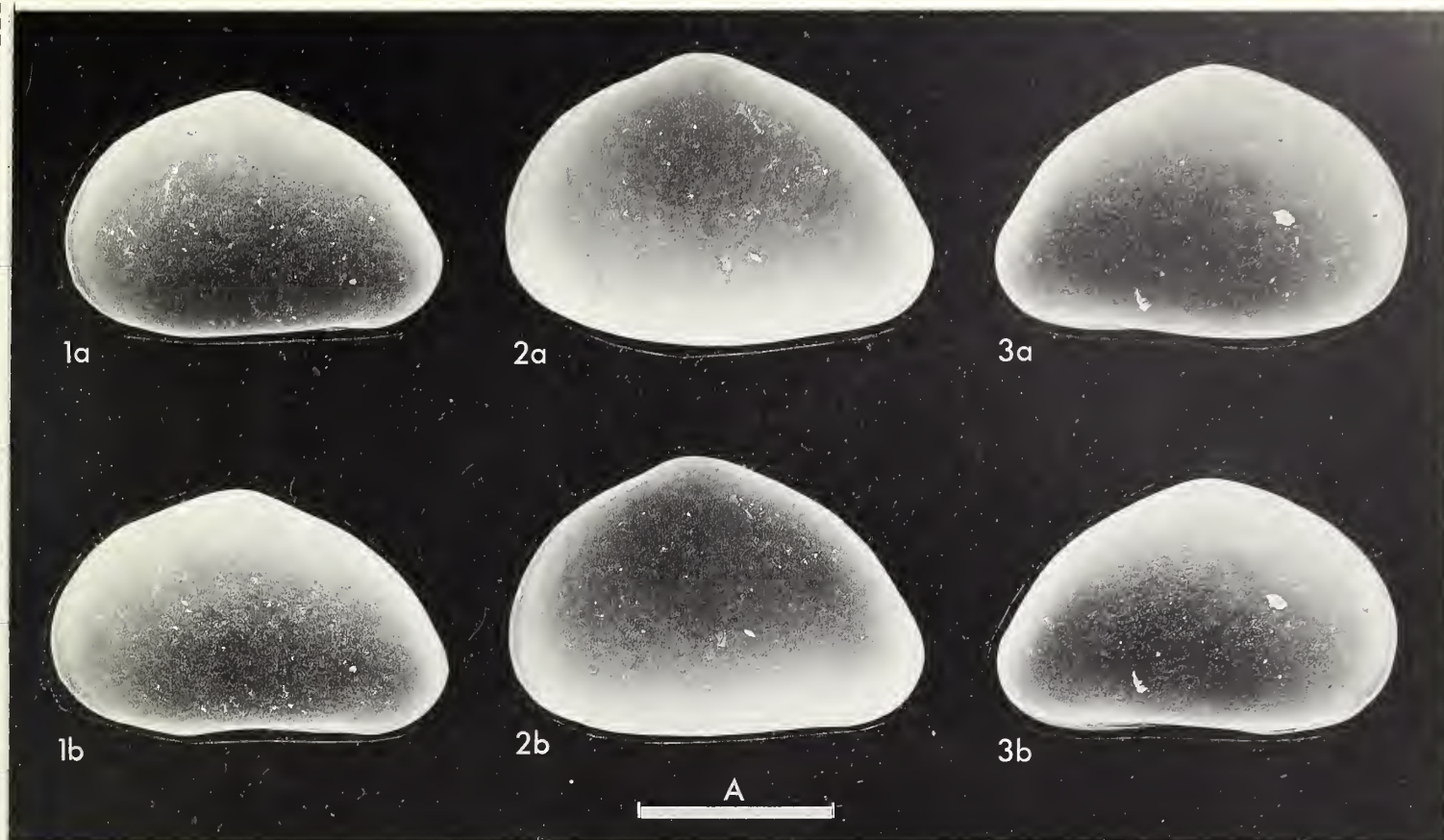
Remarks: When preserved in alcohol, the shell of *C. yapinga* is colourless. This species possesses the radial septae (Pl. 9, 140, fig. 1) best seen in transparent light as in all *Cypretta* species. However, the row of posteroventral nodes on the inner lamella in RV typical of the genus could not be seen in *C. yapinga*. A general review of *Cypretta* species is available in Sohn and Kornicker (*Smithson. Contr. Zool.* **141**, 1973) and shows that *C. yapinga* is one of the largest species known in the genus. It is also represented by both sexes, a fairly uncommon feature for *Cypretta* species. In females, there is an additional claw attached to the last segment of the antenna; it is 2/3 the length of the other claws and is thinner.

Undissected specimens of *C. yapinga* are deposited in the Australian Museum under no. **P32565**.

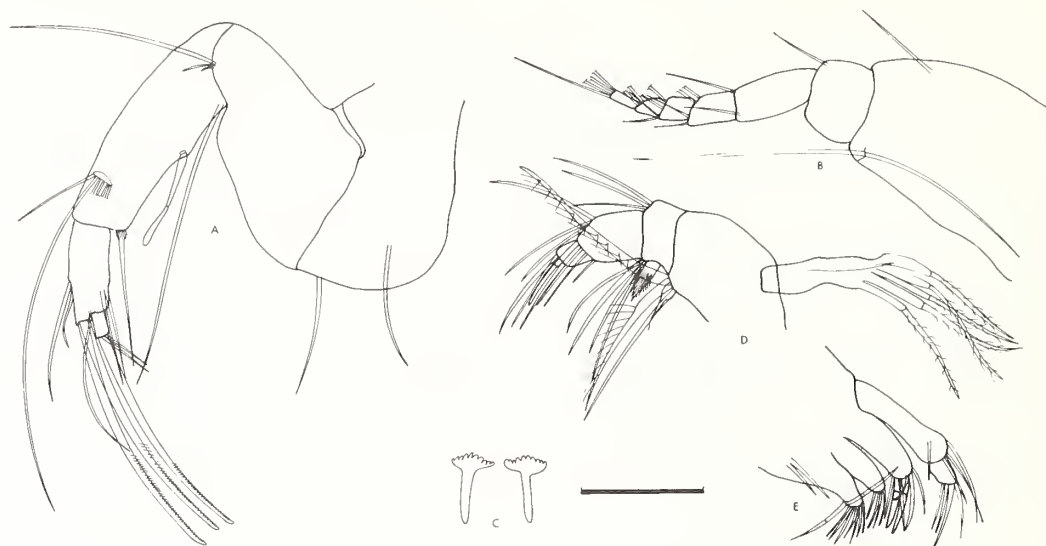
Distribution: So far *C. yapinga* has only been recorded from the type locality. For more details on Mudginberri Lagoon see Marchant *Aust. J. mar. Freshwat. Res.* **33**, 329-342, 1982). At the time of collection (17.1.1980) pH of the water was between 6 and 7, water temperature close to 30°C and water was turbid. The sample was collected in the littoral zone, over submerged grass and macrophytes. I wish to thank R. Marchant for this information and the specimens. Uranium mining (Ranger Uranium Mine) has recently started near Magela Creek and *C. yapinga* could prove to be an ideal biological "sensor" to study the input of metals in the creek waters and which could be taken up by the organisms in their shells in the billabongs along the Creek.

Explanation of Plate 9, 136

Fig. 1, ♀ LV, int. lat. **P32559**, 960 µm long); fig. 2, ♂ LV, int. lat. (**P32556**, 950 µm long); fig. 3, ♂ RV, int. lat. (**P32556**, 990 µm long). All paratypes.
Scale A (500 µm; × 58), figs. 1-3.



Text-fig. 1, ♂ (paratype **P32556**) A: antenna; B: antennula; C: rake-like organ; D: mandibular palp; E: masticatory processes and palp.

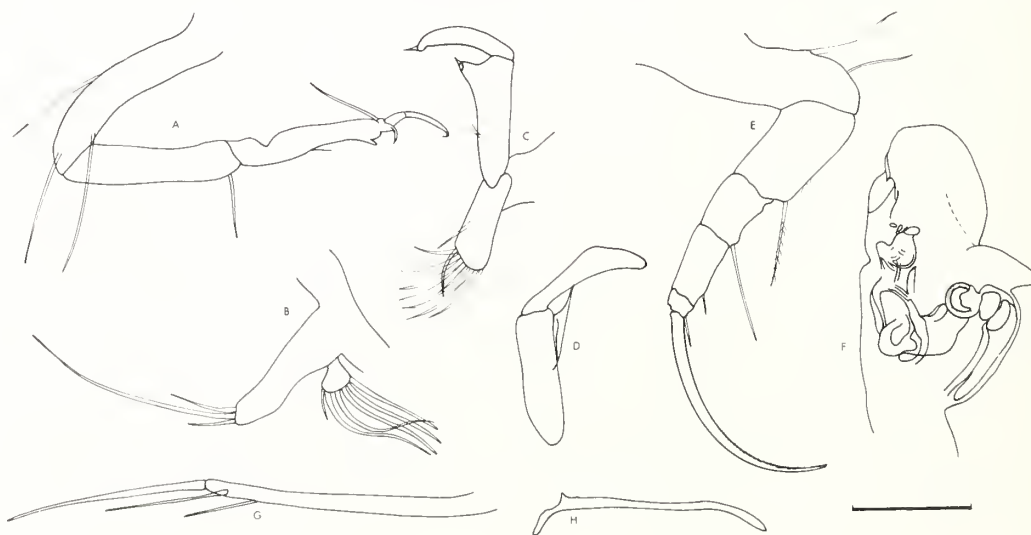


Explanation of Plate 9, 138

Fig. 1, ♂ car. ext. dors. (**P32560**, 960 μ m long); fig. 2, ♀ car. ext. vent. (**P32562**, 1020 μ m long); fig. 3, ♂ car. ext. lt. lat. (**P32561**, 930 μ m long). All paratypes.

Scale A (500 μ m; $\times 58$), figs. 1-3.

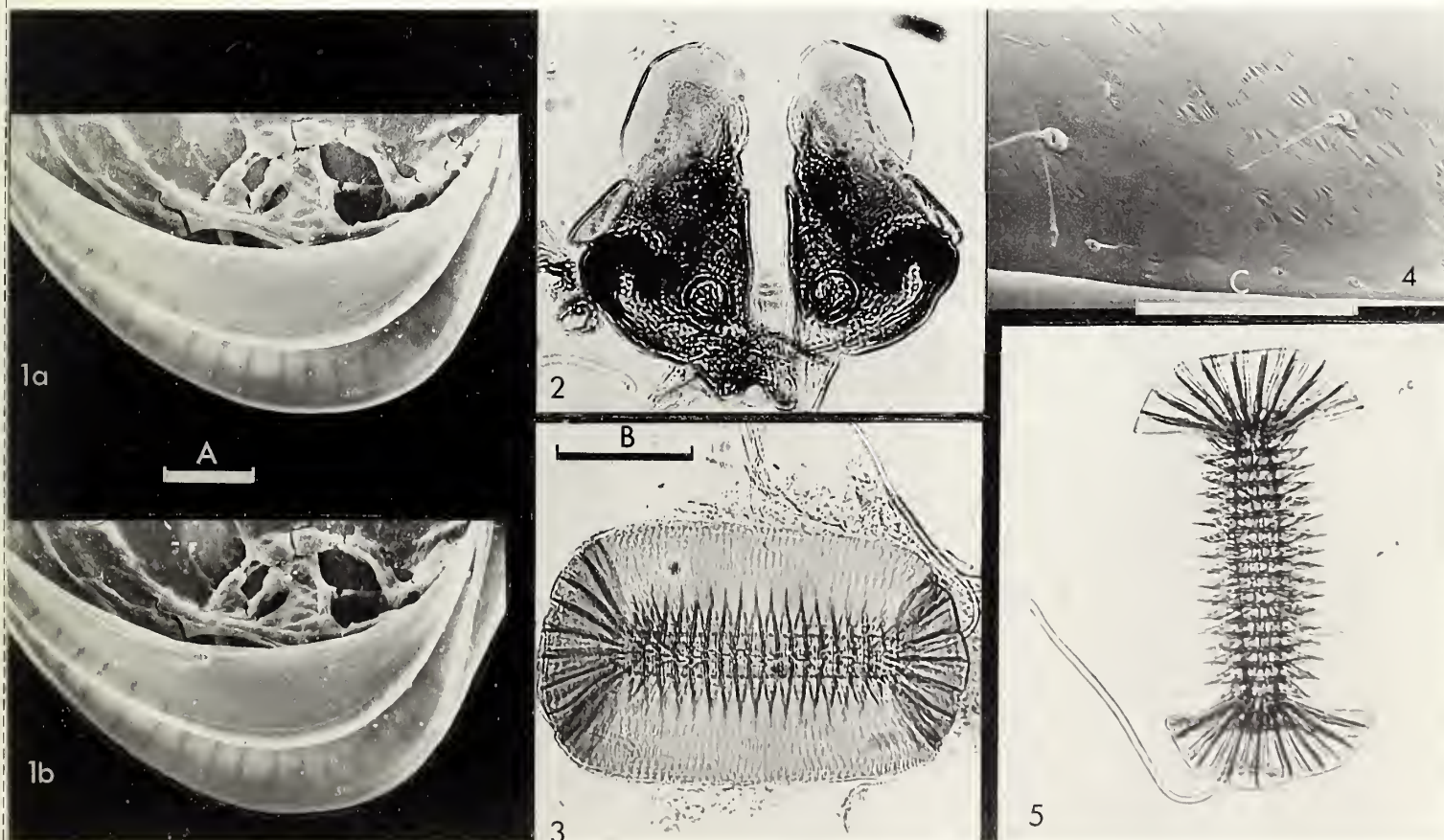
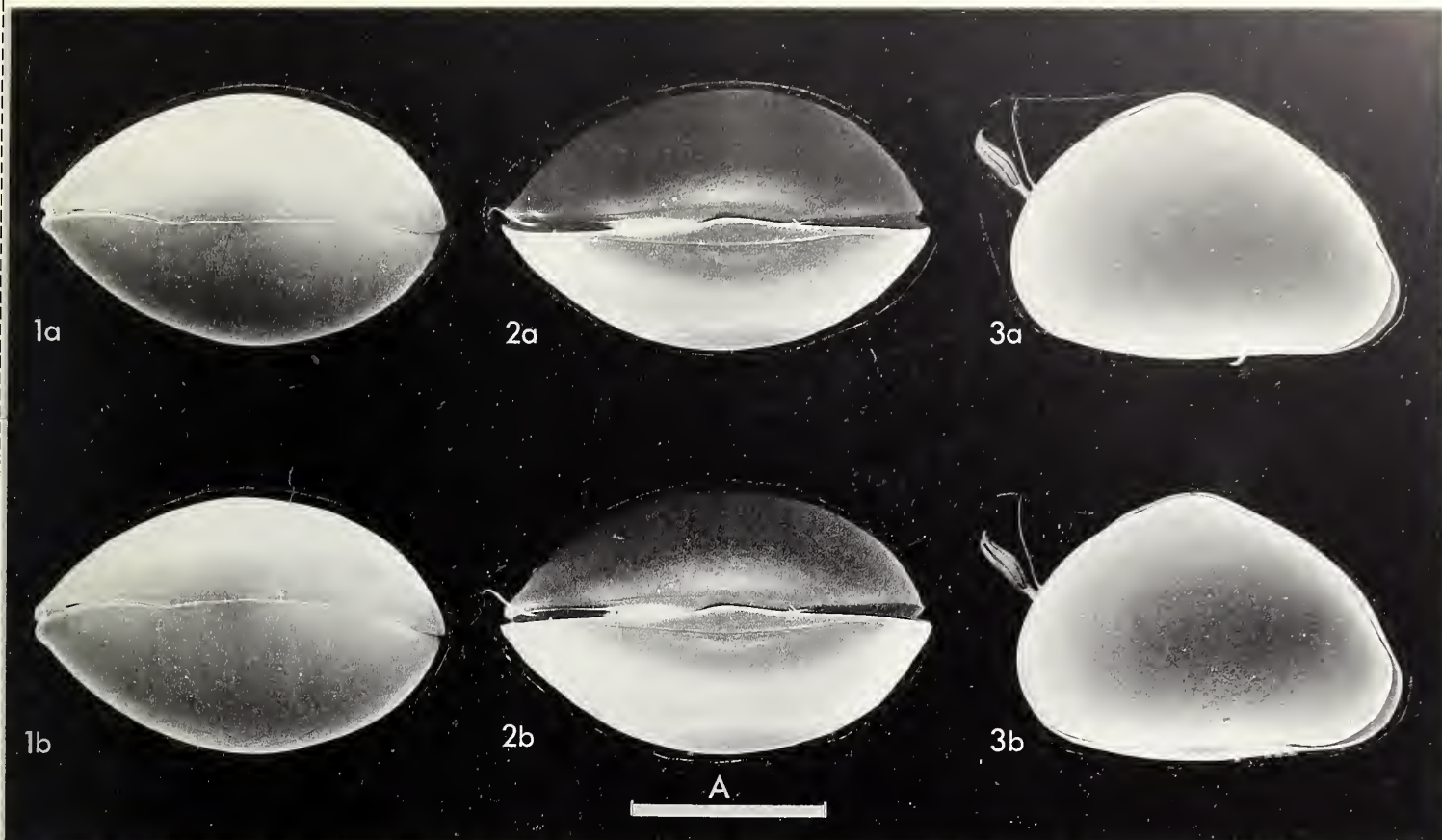
Text-fig. 2, ♀ (paratype **P32558**) A: thoracopoda II; B: maxilla. ♂ (paratype **P32556**) C: right maxillular palp and epipod plate; D: left maxillular palp; E: thoracopoda I; F: hemipenis; G: furca; H: furcal attachment.



Explanation of Plate 9, 140

Fig. 1, ♂ RV, int. lat., detail of anterior area (paratype, **P32556**, 580 μ m long); fig. 2, ♂, hemipenis (holotype, **P32557**, 280 μ m long); fig. 3, ♂, Zenker organ (paratype, **P32556**, 330 μ m long); fig. 4, ♂ car. dors., showing pore canals and setae in hinge area (paratype, **P32560**, 110 μ m long); fig. 5, ♂, Zenker organ with external sheath removed (holotype, **P32557**, 330 μ m long).

Scale A (100 μ m; $\times 200$), fig. 1; B (100 μ m; $\times 180$), figs. 2, 3, 5; C (50 μ m; $\times 1040$), fig. 4.



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| (420) | England:
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ON *EUCYPRIS FONTANA* (GRAF)-ADDENDA

by Patrick De Deckker
(Australian National University, Canberra)

The following ammendments to my 1981 paper (*Stereio-Atlas of Ostracod Shells*, 8, 87-92, 1981) should be noted:
Under *Type locality*, delete the words 'Freshwater' and 'Antarctica' (The same words should be deleted on the *Notiocypridopsis frigogena* paper—*Stereio-Atlas of Ostracod Shells* 8, 101, 1981—under the type locality).
Under *Diagnosis*, line 4, delete 'Right furca without anterior seta'.
Under *Distribution*, line 3, after 'et al' add '(Br. Ant. Surv. Data 3, 1979 and' and delete the first bracket on line 4.

In addition to the above, new information has necessitated the inclusion of the following sentence to replace the second paragraph under *Remarks*:

'It is surprising to find that the right furca of *E. fontana* from Signy Island does not possess an anterior seta—an unusual phenomenon among eucyprid ostracods. It is present, however, on the type material'.

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